6-2-1997

A Comparison of Parent Interview and Direct Assessment of Receptive Language in Preschool-aged Children with Cerebral Palsy

Susan Kathleen Livick
Portland State University

THESIS APPROVAL

The abstract and thesis of Susan Kathleen Livick for the Master of Science in Speech Communication: Speech and Hearing Sciences were presented on June 2, 1997, and accepted by the thesis committee and the department.

COMMITTEE APPROVALS:

[redacted]
Rhea Paul, Chair

[redacted]
John Tetnowski

[redacted]
Carol Mack
Representative of the Office of Graduate Studies

DEPARTMENT APPROVAL:

[redacted]
Stephen A. Kosokoff, Chair
Department of Speech Communication

****

ACCEPTED FOR PORTLAND STATE UNIVERSITY BY THE LIBRARY

by [redacted] on 9-12-97

ABSTRACT

An abstract of the thesis of Susan Kathleen Livick for the Master of Science in Speech Communication: Speech and Hearing Sciences presented on June 2, 1997.

Title: A Comparison of Parent Interview and Direct Assessment of Receptive Language in Preschool-Aged Children with Cerebral Palsy.

Cerebral palsy is a multiply handicapping condition which may affect motor skills, hearing, sight, speech and cognitive functioning. Assessment instruments which do not rely on an intact sensory and motor system are needed for use with the population with cerebral palsy in order to obtain valid information regarding levels of functioning. The information obtained from the results of modified assessment instruments can be used to plan and implement intervention at the child's current level of functioning.

The purpose of the present study was to determine whether or not parent interview/report is a reliable means of assessing receptive communication skills in preschool-aged children with cerebral palsy. Additionally, the relationship between motor skills and receptive language skills in terms of

severity of motor impairment was examined.

The subject pool was comprised of fifteen children, 10 males and 5 females, between the ages of three to six years who were participating in a longitudinal study at Portland State University. Each subject and his/her mother participated in a two and a half hour in-home assessment session. A physical therapy student accompanied this examiner to the subject's homes in order to address positioning needs before the direct measure was administered. Both the Vineland Adaptive Behavior Scale - Interview Format and the Peabody Picture Vocabulary Test - Revised were administered to each participating subject.

A Spearman correlation coefficient was performed in order to examine the strength of the relationship between parent report/interview and direct assessment. A significance value of .05 was used. Results revealed that parent report is a valid means for assessing receptive communication skills in the preschool-aged population with cerebral palsy. Two one-way measures of analysis of variance (ANOVA) were performed in order to examine whether or not a significant difference existed, among the categories of motor impairment in terms of receptive

communication and receptive vocabulary scores. Significant differences were not found for the development of receptive language skills between the categories of motor impairment in this sample. However, further research using a larger sample size may identify significant differences between the moderate and severe groups in terms of scores obtained on the PPVT and the VABS receptive subscale.

A COMPARISON OF PARENT INTERVIEW AND DIRECT ASSESSMENT OF RECEPTIVE LANGUAGE IN PRESCHOOL-AGED CHILDREN WITH CEREBRAL PALSY

by

SUSAN KATHLEEN LIVICK

A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE
in
SPEECH COMMUNICATION:
SPEECH AND HEARING SCIENCES

Portland State University
1997

ACKNOWLEDGEMENTS

I wish to express my appreciation to a number of individuals who have been invaluable to me throughout my graduate program.

Dr. Rhea Paul, for without her guidance, support and encouragement this study would not have been possible. Her enthusiasm for research along with the establishment of graduate research assistant positions have allowed me to experience speech and language pathology in a broader sense.

A special thanks to Dr. John Tetnowski for his dedication to all students and for his ongoing and never ending assistance in the planning of the last three years of my college career.

I would also like to thank all the families who opened up their homes and busy schedules to participate in the study.

My mother and father are graciously appreciated, for without their loving guidance and inspiration I would not be the woman I am today.

Finally, an enormous debt of gratitude is owed to my husband, Jeff, whose positive outlook on life, sense of humor, and emotional support assisted me throughout the tribulation of extended education.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION AND STATEMENT OF PURPOSE

INTRODUCTION

Cerebral palsy is a multiply handicapping condition caused by brain damage occurring before, during, or shortly after birth and characterized by motor dysfunction and a variety of associated problems (McDonald, p. 3). Cerebral palsy not only affects motor skills but may also involve impairments of hearing, sight, speech, and cognitive functioning. Degrees of involvement in each area of impairment can range from minimal to severe. Thus, no typical profile of functioning exists amongst this population (Parker, 1987).

Valid assessment of language skills in nonvocal, physically disabled individuals has been an ongoing challenge for many professionals. Most assessment instruments rely on an intact sensory and motor system, allowing the individual to manipulate objects and speak intelligibly. In 1975, with the passage of Public Law 94-142, the Education of All Handicapped Children act, professionals became obligated to provide nondiscriminatory assessments that made provisions for the response limitations of this population (Johnson-Martin, Wolters, & Stowers, 1987).

Reported assessment results are used to (1) provide access to services, (2) to determine the most appropriate learning environments and educational programs, and (3) to develop effective augmentative communication systems (Johnson-Martin, Wolters, & Stowers, 1987).

Invalid assessment techniques and results regarding levels of functioning can effect the nonvocal, physically handicapped child in a variety of ways. Parents and teachers are influenced by reported scores and may fashion the environment based on their beliefs about the child's capacities for learning. Expectations may be lowered in terms of linguistic, social, and developmental demands made on the child to be an active participant in his/her environment (Johnson-Martin, Wolters, & Stowers, 1987). Furthermore, the type of classroom placement, whether academically-based or one which focuses upon functional living skills, is determined by reported levels of functioning. These administrative decisions, based on invalid test results, can effect the quality of stimulation and education the child will receive throughout their entire school experience (Johnson-Martin, Wolters, & Stowers, 1987).

STATEMENT OF PURPOSE

The purpose of this study was to address the language assessment difficulties posed by this population in terms of validity of parent interview/report vs. direct assessment. Additionally, the relationship between the varying degrees of motor impairment and the development of receptive communication and receptive vocabulary was examined. The following questions were addressed in the study:

1. Is there a significant relationship between the receptive communication age equivalent obtained through parent interview (VABS) and the receptive vocabulary age equivalent obtained through direct assessment (PPVT-R)?

2. Is there a significant relationship between the motor skills age equivalent and the receptive communication age equivalent, both obtained through parent interview (VABS)?

3. Is there a significant relationship between the motor skills standard score obtained through parent interview (VABS) and the receptive vocabulary standard score obtained through direct assessment (PPVT-R)?

4. Are there significant differences among the different diagnostic categories of motor impairment in terms of the receptive communication (VABS) and receptive vocabulary (PPVT-R) developmental quotients?

The null hypothesis for question one states that there will be no significant correlation between the receptive communication age equivalent and the receptive vocabulary age equivalent.

The null hypothesis for question two states that there will be no significant correlation between the motor skills age equivalent and the receptive communication age equivalent.

The null hypothesis for question three states that there will be no significant relationship between the motor skills standard score and the receptive vocabulary standard score.

The null hypothesis for question four states that there are no significant differences between the diagnostic categories of motor impairment in terms of receptive communication and receptive vocabulary developmental quotients.

DEFINITION OF TERMS

The following are descriptions of specific terms used in this study.

> Cerebral Palsy: A multiply handicapping condition caused by brain abnormality resulting from maldevelopment or damage occurring before, during, or shortly after birth and characterized by motor dysfunction and a variety of associated problems (McDonald, p. 3).

Cognition: The process or processes by which an organism gains knowledge of or becomes aware of events or objects in its environment (Bloom & Lazerson, p. 353).

Expressive Language: A coded system of communication that uses the modalities of speaking, writing, and signing (Bloom & Lazerson, p. 353).

Fine Motor Skills: How the individual uses hands and fingers to manipulate objects (Sparrow, Balla, & Cicchetti, p. 3).

Gross Motor Skills: How the individual uses arms and legs for movement and coordination (Sparrow, Balla, & Cicchetti, p. 3).

Nonvocal: Refers to individuals with no intelligible speech (Johnson-Martin, Wolters, & Stowers, p. 24).

Receptive Communication: What the individual understands (Sparrow, Balla, & Cicchetti, p. 3).

Receptive Language: The ability to understand what we hear or read (Boone, p.32).

Severe Cerebral Palsy: Extreme motor dysfunction on all gross and fine motor channels, such that the individuals are quadriplegic, mobile only by wheel chair, unable to perform self-care activities or to use their hands to manipulate objects, and anarthric or severely dysarthric (Berninger & Gans, p. 45).

CHAPTER II

REVIEW OF THE LITERATURE

DEFINITION, CLASSIFICATION, TOPOGRAPHY AND SEVERITY OF CEREBRAL PALSY

Cerebral palsy was defined by McDonald (1987) as a multiply handicapping condition caused by brain abnormality resulting from maldevelopment or damage occurring before, during, or shortly after birth and characterized by motor dysfunction and a variety of associated problems (p. 3). Associated problems such as impairments in cognitive functioning and communication, and difficulties with social-emotional development, academic success, and seizure disorders may be more limiting than the underlying motor dysfunction itself (McDonald, 1987).

Classification

Cerebral palsy is a general term used to describe a diverse population with motor impairments. There are many different symptoms of the underlying motor disorder, hence, several nosological systems are in use to classify individuals within this population. The following subgroups described in this thesis are those suggested by the American Academy of Cerebral Palsy

(AACP) (McDonald, 1987). O' Reilly and Walentynowicz (1981) offer a percentage for each category based on their St. Louis study of 2,004 cases obtained from a metropolitan cerebral palsy clinic.

Spasticity. This is the most common type of cerebral palsy, where a hyperactive stretch reflex is the distinguishing feature. In the normal population, a stretch reflex is imperative for the maintenance of posture and muscle tone. In this subgroup, however, exaggerated stretch reflexes result in impaired mobility, abnormal postures and contractures (McDonald, 1987). In the 1981 St. Louis study, 62.8% of the clients seen for treatment in the clinic were diagnosed as having spastic cerebral palsy.

Athetosis. Uncontrollable and arrhythmic movement is the identifying feature of athetosis. This is the second most common type of cerebral palsy, where 11.7% of the subjects in St. Louis study fell into this category. The involuntary movement observed in this subgroup makes it almost impossible to perform simple motor acts (McDonald, 1987).

Rigidity. "The distinguishing neuromuscular characteristic of rigidity is resistance to flexion and extension

movements resulting from continuous, simultaneous contraction of both the agonist and antagonist muscle groups" (McDonald, 1987). Individuals with this type of cerebral palsy are capable of a limited range of slow movement. In the St. Louis survey, 7.2% of the subjects were diagnosed as having rigid cerebral palsy.

Ataxia. This form of cerebral palsy is most commonly diagnosed after the child begins to walk because it is characterized by incoordination and difficulty in the maintenance of balance. Hypotonia or muscular weakness may accompany this disorder (McDonald, 1987). In the St. Louis study, 4.9% of the subjects were diagnosed as having ataxic cerebral palsy.

Tremor. In this subgroup, repetitive, rhythmic involuntary contractions of the flexor and extensor muscles are observed. These tremors can be intentional, appearing with voluntary movement, or nonintentional, present during rest and continue with intentional movement (McDonald, 1987). Of the entire sample of 2,004 subjects in the St. Louis study, only 0.3% were diagnosed with tremor cerebral palsy.

Atonia. Atonia, specifically defined, means without or

deficient in muscle tone (McDonald, 1987). In the St. Louis survey, 1.1% of the sample were diagnosed as having cerebral palsy of the atonic type.

Mixed. Individuals with cerebral palsy are unique, hence, some exhibit combinations of neuromuscular impairment. Schleichkorn (1983) found that the most common combination is spasticity in the lower extremities and athetosis in the hands and arms (McDonald, 1987). In the study based in St. Louis, 12% of the sample cases were diagnosed as having mixed cerebral palsy.

Topography

Individuals with cerebral palsy are further classified into subgroups based on the topography, or number and location of limbs affected by the motor impairment. The four most common topographies are listed and described below (McDonald, 1987):

Hemiplegia:	One entire side of the body is affected.
Paraplegia:	Only the legs are involved.
Quadraplegia:	All four limbs are involved.
Diplegia:	All four extremities affected, with the legs primarily and the arms only slightly involved.

Severity

The American Academy for Cerebral Palsy has provided guidelines for the definition of the degree of severity of motor impairment in terms of functional capacity (Minear, 1956).

Class I- No practical limitation of activity

Class II- Slight to moderate limitation of activity

Class III- Moderate to great limitation of activity

Class IV- Unable to carry on any useful physical activity.

In 1977, Rusk proposed a more descriptive and widely used set of guidelines to determine the severity of motor disorder. He based the following criteria on the individuals competence in carrying out activities of daily living.

Mild: A person with self-help skills adequate for caring for daily personal needs, who ambulates without appliances and has no speech problem.

Moderate: Self-help skills are inadequate, and the person may need special equipment for ambulation. Speech may be defective.

Severe: Even with treatment and the use of adaptive equipment, the prognosis for developing self-help skills, ambulation, and functional speech is poor. (McDonald, p. 7)

PERCEPTUAL - MOTOR, COGNITIVE, AND COMMUNICATION IMPAIRMENTS IN CEREBRAL PALSY

Many obstacles exist in the developmental path of children with cerebral palsy. Motor problems exhibited by this population can affect perceptual and cognitive skills. These, in turn, may hinder the development of speech and language (Carlson, 1987).

Perceptual - Motor Effects

Children without motor limitations will explore their environment through the use of speech and physical interaction across a variety of objects, contexts, and communication partners. Nondisabled children will receive and process feedback from these interactions, hence, the development of cognitive and language foundational skills (McNaughton, 1993).

Children with cerebral palsy are often affected by perceptual problems (i.e. visual and auditory acuity deficits and tactile motokinesthetic feedback disruptions) which may distort and limit the environmental information received by the child. Infants with cerebral palsy are at risk for sensorineural and conductive hearing loss, as well as, oculomotor defects and central processing problems. Body sensations may be affected in children with cerebral palsy where some may have diminished sensitivity while others are tactile defensive. Additionally, proprioception, kinesthesis and vestibular motion relating to the child's posture and movement may be diminished or disordered. These difficulties further reduce the quantity and quality of childhood experiences from which language is based (Carlson, 1987).

Speech production is adversely affected in this population. The act of speaking requires precise coordination of the muscles which control respiratory, phonatory, and articulatory movements. Again, the effect of the motor impairment manifests itself differently from individual to individual and may change over time (Carlson, 1987).

Cognitive Effects

Motor and perceptual problems found in this population can detrimentally affect the valid assessment of cognition. The motorically impaired child may interact with objects in the environment in a sensorimotor fashion due to lack of exposure, thus leading an observer to underrate the child's cognitive skills. Children with age appropriate cognitive skills have been misdiagnosed as being cognitively impaired solely because accommodations for their motor limitations were not made during assessment (Carlson, 1987).

The development of symbolic representational skills may be delayed in children with cerebral palsy due to the limited quantity and quality of controlled motor behavior available to this population (McNaughton, 1993). Initiation of interactions with objects and others in the environment provide the non-impaired child with a variety of experiences from which a symbolic knowledge base may be built. Conversely, children with motor impairments must learn from observing the behavior of others in his/her environment, not necessarily directly interacting with the objects or people within it (McNaughton, 1993). "This behavior may or may not result in

feedback that is at the appropriate developmental level and hence interpretable by the child" (McNaughton, 1993).

Likewise, the use of expressive language in the population with motor impairments is delayed which, in effect, creates a lack of experience with the use of a symbolic mode for communication purposes (McNaughton, 1993). McNaughton asserts that these children "must be able to control some form of aided system (a communication board or a voice output device containing a graphic representational system) before they can initiate their intentions in a language medium." Language usage by the child's communication partners which directly correspond to his/her developmental level can only enhance, not hinder, the development of symbolic representational skills (McNaughton, 1993).

It is generally believed that there is a much greater incidence of mental retardation in the population with cerebral palsy than in the nonimpaired population. The incidence and degree of retardation is related to the type and extent of motor impairment. However, since there are documented accounts of people with cerebral palsy with age appropriate cognitive skills, and because of obvious limitations in cognitive testing materials,

one must be skeptical of the previously reported estimates of mental retardation in this population (Johnson-Martin, Wolters, & Stowers, 1987).

Communication Effects

The atypical movement patterns observed in cerebral palsy can impinge on the child's exploration and interaction with the environment with its impact varying based on the physiological site affected and the degree of involvement (Carlson, 1987). These preliminary movements are the basis for infant communication which establish a foundation for later speech and language development (Piaget, 1952; Piaget & Inhelder, 1969).

Language development is affected by the motor impairment in two ways: (a) exposure to consistent motor experiences which aid in the perception of basic concepts later used in language are unavailable to children with cerebral palsy, and (b) the quantity and quality of successful communicative interactions through which the child discovers the function of language is lacking (Carlson, 1987).

Children with motor impairments lack in the experience of basic cause and effect relationships relating to environmental

changes due to vocalizing and volitional movement which comprise early speech attempts (Carlson, 1987). Early language development may be negatively affected in this population because of minimal experience in the following areas: "the social use of talk to share meanings with others; the demonstrated knowledge of speech structures by applying the rules of ordering words and making agreements between words; the different purposes of talk, involving the child's meanings, his or her thinking, and the kind of information he or she is using language to convey; and metalinguistic awareness" (McNaughton, p. 61). Mildly impaired children with cerebral palsy may not be deficient in these experiences, however, their active participation in communication may be delayed and/or asynchronous with their cognitive skills (Carlson, 1987).

Kraat (1991) inquired whether different experiences and communicative environments could result in an unique pattern of language acquisition for children with cerebral palsy. As a result of their physical limitations, these children may not have been exposed to nor interacted with the environment in a similar manner compared to their non-disabled peers (Kraat, 1991). Lack of experience with cause/effect relationships and

the manipulation of objects impacts the development of skills required for learning and perceptual refinement in adverse ways (Parker, 1987).

In a three-part study conducted by Light, Collier, and Parnes (1985), the communicative interaction patterns of eight children and their caregivers were observed and analyzed in terms of discourse patterns, communicative functions, and modes of communication during a twenty minute free play session. Each child was between the ages of four and six, nonspeaking and physically disabled since birth. These examiners found a highly asymmetrical pattern of discourse between the children and their caregivers. Caregivers were observed to control the communicative interaction through "occupying more of the conversational space, by initiating topics, and by exerting maximal summoning power in their turns and demanding specific responses from the children" (Light, Collier, and Parnes, 1985a).

Next, communicative functions were analyzed during the previous free-play sample with the caregiver and compared to structured play situations with a clinician trained in augmentative communication strategies. It was discovered that

during free play with the caregiver, the children produced a majority of yes/no responses (39%) or direct responses to information requested by the caregiver (18.4%). It was further noted that the children in the study rarely requested information or clarification, nor produced social greetings and closings. A broader range of communicative functions were elicited by the clinician through the use of sabotage techniques (Light, Collier, and Parnes, 1985b).

Finally, the modes of communication were assessed relative to this sample and their primary caregivers. It was found that multiple modes were used by this population of augmentative users to communicate; not limited to the use of the augmentative device. The children were observed to use vocalization, gesture, and/or eye gaze, either alone or in combination, during 81.8% of their communicative turns (confirmations and denials). Interestingly, only 18.2% of the children's communicative turns, primarily provisions of information and clarification, were expressed through the use of augmentative devices (Light, Collier, and Parnes, 1985c).

Holistically, the motor impairments observed in children with cerebral palsy can adversely affect social communicative

interactions. Facial expressions, visual tracking, and fixation are important components in the communicative partners' deciphering of the child's intent through body language. If a child's communicative attempts go unrecognized, they may never understand the concept of initiation of control over their environment and the people within it. In fact, in the more severely impaired child, motoric responses to the environment may be distorted, delayed, absent, or even dependent upon specific cues supplied by familiar communicative partners (Carlson, 1987).

Receptive Language Research in Cerebral Palsy

Bishop, Brown, and Robson (1990) inquired as to how a child's motor limitation may affect his/her ability to understand and use language, or verbal processes, in mental operations. A sample of twenty-four subjects with impaired speech production were compared to a control group with normal speech production on receptive language measures. All of the subjects were diagnosed with cerebral palsy with the groups matched according to age and nonverbal ability. Results indicated that the speech-impaired group were less successful compared to the control group in terms of receptive vocabulary scores, but not in

the comprehension of grammatical forms (Bishop, Brown, and Robson, 1990).

In summary, group studies of the receptive language development in children with cerebral palsy are extremely limited. The Bishop et. al. study found receptive vocabulary scores to be affected by motor impairments, whereas, comprehension of grammatical forms are not. It is very difficult to provide appropriate intervention programs for these children when obvious motor limitations mask their underlying cognitive and receptive language capacities. These children have the right to an appropriate education, therefore it is our obligation, as professionals in the field of speech and language pathology, to provide a valid yet comprehensive assessment independent of existing motor limitations.

DIFFICULTIES IN THE ASSESSMENT OF INDIVIDUALS WITH CEREBRAL PALSY AND POTENTIAL SOLUTIONS

Unique problems are posed when assessing children with cerebral palsy because of their motor limitations and atypical behaviors. Standardized tests do not allow for flexibility in the interpretation of communicative behaviors in this population. Information from adaptive testing, skilled observation, and

parent interviews can complement that which is derived from standardized testing (Carlson, 1987).

Norm-referenced tests are commonly used when qualifying children for special services. Unfortunately, these measures depend heavily upon motor skills and may not provide an accurate assessment of receptive nor expressive communication skills in children with cerebral palsy. Criterion-referenced tests are more flexible in that materials and procedures may be substituted for relevant items previously experienced by the child. Thus, a more accurate interpretation of the child's communicative abilities emerge when using a criterion-referenced measure (Carlson, 1987).

Adaptation

Adaptation of measures used during the assessment of children with cerebral palsy is essential for valid results regarding levels of functioning. In the adaptation, the intent or purpose of the instrument or items within it remain undisturbed, yet the materials and mode of indication or response may be changed to suit each individual's motor abilities (Carlson, 1987). For example, item #15 in the Communication Domain of The Vineland Adaptive Behavior

Scales: Interview Edition, Survey Form, (Sparrow, Balla, & Cicchetti,1984), focuses on the verbal production of two word phrases. This item may be adapted for children with cerebral palsy to allow credit for the gestural production of two word combinations, so that their communication skills are not discounted based on the underlying motor impairment of the speech mechanism.

Parent Report

Parent interviews and checklists are invaluable resources for professionals compiling communicative information. In addition to being cost-and-time effective, they can provide a more representative sample of what the child is capable of doing in more than just one setting or one situation (Fenson, et. al., 1994). Assessment in the form of a language sample or an observation within the clinic restricts the amount of information available to the professional in making a valid diagnosis or an appropriate intervention plan. Parents of children with cerebral palsy are more capable in recognizing intentional communication and may provide the familiar contextual cues needed to stimulate its' production (Carlson, 1987).

In a longitudinal study conducted by Bates et. al. (1988)

the relationship between parent report of vocabulary and scores obtained through the collection of a language sample in typically developing children was examined. The parent report of vocabulary skills was correlated with the vocabulary collected through the language sample at r = +0.83, thus indicating the validity of obtaining information through parent report versus collecting and analyzing an entire language sample.

Soriano, Paul, and Cohen (1988) examined the correlation between Vineland communication domain scores obtained through parent interview and scores obtained from direct standardized testing in their longitudinal study of children with developmental language disorders. These researchers found a high correlation between parent report and other direct measures of receptive and expressive language (.93 and .84 respectively).

Observation

Observation, an informal assessment technique, is another method used when assessing children with cerebral palsy. The examiner is able to discover how the child uses movement, eye gaze, and vocalizations in relation to objects, people, and routines in his/her environment (Carlson, 1987). Unfortunately, the

potentially long delays in the response time of children with motor impairments could negatively effect the amount of information obtained within one clinical session. Therefore, due to the time constraints found within the clinical setting, a combination of observation and parent report may be the most reasonable method of assessment.

In summary, there are many avenues that professionals can take in regards to the assessment of the child with cerebral palsy: adaptation of norm-referenced tests, criterion-referenced tests, parent interview or checklist, or observation. It is important that professionals remain flexible in the instruments, materials, and method of indication used during the assessment process, due to the uniqueness of each individual with cerebral palsy. It would be an injustice to the child if his/her abilities were not discovered because of invalid assessment instruments and/or the compounding effect of motor dysfunction.

There is a great need for efficient, yet reliable methods in the assessment of children with cerebral palsy particularly in the area of receptive language. It is the intention of this study to provide data that will indicate parent report as a valid means of measuring receptive language in this population. This finding

could potentially save professionals considerable time previously spent adapting materials and administering direct assessments which are not normed for use with the population with motor impairments. This examiner will attempt to provide data that further supports previous research which documented the importance of not assuming a child's receptive language understanding based on his/her expressive language skills.

CHAPTER III

METHODS AND PROCEDURES

METHODS

Subjects:

This study included 15 children, 10 males and 5 females, who were participating in a larger study at Portland State University. These children were between the ages of 3-years and 6-years at the time of participation and were all currently receiving special services through local early intervention programs.

Each child was previously diagnosed with cerebral palsy, although types of impairment differed from individual to individual. This examiner classified each subject into mild, moderate, and severe groups based on severity of motor disorder using the criteria proposed by Rusk (1977). In this study there were two mildly impaired (13.3%), seven moderately impaired (46.7%), and six severely impaired subjects (40.0%) (See Table 1). Of the total sample, subjects five and six, were born from a fraternal triplet pregnancy where one sibling was left unaffected. Additionally, subject number thirteen was a fraternal twin with his sister born unimpaired.

TABLE 1

SUMMARY OF SUBJECTS

SUBJECT #	AGE IN MONTHS	GENDER	GROUP
3	68	male	mild
9	68	female	mild
6	37	male	moderate
4	62	male	moderate
12	62	male	moderate
7	52	male	moderate
11	47	female	moderate
2	56	female	moderate
13	41	female	moderate
8	72	male	severe
1	44	male	severe
10	50	male	severe
14	71	male	severe
15	43	male	severe
5	37	female	severe

The subjects were obtained from a variety of sources (local hospitals, early intervention programs, and word of mouth) as a part of a previous study conducted at Portland State University in the Speech and Hearing Sciences Program. The following eligibility criteria were used in the selection of the participants:

1. Age between three and six years.

2. A diagnosis of cerebral palsy by a medical professional.
3. Moderate to severe motor speech impairments that preclude the use of speech as a primary mode of communication.
4. Adequate motor skills to participate in the study using hand pointing or eye gaze as the method of indication.
5. English as a primary language in the home.
6. No uncorrected hearing or vision impairments.
7. No diagnosis of autism, Down Syndrome, or other genetic or metabolic disorder that could interfere with cognitive development.
8. An adult in the home who can complete questionnaires used in the study.

The nature of the study was explained both orally and in writing to the parents. Each parent signed a written permission form for participation in the study.

Instruments

The Vineland Adaptive Behavior Scales: Interview Edition, Survey Form, measures adaptive behavior in four domains:

Communication, Daily Living Skills, Socialization, and Motor Skills (Sparrow, Balla, & Cicchetti, 1984). The survey form, containing 297 items, is administered in a semi-structured interview format with the parent or caregiver and lasts between 20 and 60 minutes. Norm-referenced information such as raw scores, standard scores, age equivalents, percentile ranks, stanines and adaptive levels were obtained based on the performance of representative national standardized samples of approximately 4,800 handicapped and nonhandicapped individuals from birth to 18-years, 11-months old. Each domain is comprised of several subdomains. The following is a description of content for each subdomain (p. 3):

Communication-

Receptive:	What the individual understands
Expressive:	What the individual says
Written:	What the individual reads or writes

Daily Living Skills-

Personal:	How the individual eats, dresses, and practices personal hygiene
Domestic:	What household tasks the individual performs
Community:	How the individual uses time, money, the telephone, and job skills

Socialization-

Interpersonal Relationships:	How the individual interacts with

	others
Play and Leisure Time:	How the individual plays and uses leisure time
Coping Skills:	How the individual demonstrates responsibility and sensitivity to others

Motor Skills-

Gross:	How the individual uses arms and legs for movement and coordination
Fine:	How the individual uses hands and fingers to manipulate objects

Adaptive Behavior Composite:	A composite of the Communication, Daily Living Skills, Socialization, and Motor Skills domains

The Vineland (VABS) has been validated against the The Peabody Picture Vocabulary Test - Revised (PPVT-R; Dunn & Dunn, 1981). The PPVT-R was administered to the original Vineland national standardization sample of 2,018 individuals between the ages of 2-6-0 through 18-11-30. Analysis of the relationship between the VABS and PPVT-R standard scores yielded a low but positive correlation. The scores obtained in the Communication domain yielded the strongest correlation to

the PPVT-R because of the language content common to both measures.

The Peabody Picture Vocabulary Test-Revised, Form L, (PPVT-R), was developed by Dunn and Dunn in 1981 as a standardized measure to assess a subject's receptive vocabulary for Standard American English. This instrument was normed for individuals aged 2-years, 6-months through 40-years. Raw scores are converted to age equivalents, percentile rankings, standard scores, and stanines. For the purposes of this study, the receptive vocabulary standard score and/or age equivalent were reported.

Subjects were asked to indicate one picture out of a set of four which most closely corresponds with the target word provided by the examiner. Modifications were made in order to allow for a larger target for gross motor pointing with the arm or clenched fist, as well as, to aid in the use of eye gaze as a method of indication (See Appendix E). Eye gaze was used as the method of indication in 20% (3/15) of the direct assessment sessions. In one case, a male subject using eye gaze, was unable to indicate a choice in a set of four pictures as indicated by unreliable results obtained during the pretest procedures described in the

following section. However, the subject was able to indicate reliably when the field was limited to two choices as demonstrated by his ability to select the target items on five consecutive trials.

PROCEDURES

A physical therapy student from Oregon Health Sciences University (OHSU) accompanied the examiner to each session. Positioning concerns were evaluated and the most appropriate positioning was ascertained in order to reduce abnormal tone and reflexes so that each subject could utilize his/her residual movement abilities during the direct assessment.

Each subject in the study participated in a two and a half hour in-home assessment session. Initially, this examiner provided each parent with a consent form which contained details regarding continued participation in the larger study at Portland State University. Each parent was asked to sign the form, thus indicating their continued interest in their participation in the longitudinal study. Across all subjects, the mothers participated as the informants for this study.

Next, each informant was asked to share information regarding their child's development in a structured interview

with the examiner (VABS). This examiner asked open-ended questions, per Vineland protocol, regarding the subject's adaptive behavior skills in the domains of Communication, Daily Living, Socialization, and Fine and Gross Motor, respectively. For example, in order to obtain the answer for question #19 in the Daily Living Skills Domain, (Asks to use toilet) this examiner asked the parent, "Tell me about your child's toileting skills." The parent would then provide this examiner with a summary of the child's toileting skills. If the answer to the question could inferred by the parents response (i.e. "She's not potty trained yet and wears diapers all the time") this examiner would score the item and move on. If the answer could not be inferred, this examiner would ask a leading question (i.e. "How do you know when your child needs to use the restroom?") and continue to specify until the answer was satisfactorily obtained.

Modifications to the target questions used in the Vineland Interview format in the Communication and Socialization Domains were made in order to address the motor limitations in this population (See Table 2). Modifications were unnecessary for the target questions found in the Daily Living and Motor Skills domains, hence these sections were administered per

protocol. This examiner obtained a basal level of seven consecutive items scored "2 " (Yes, usually) and progressed through the interview until a ceiling of seven consecutive items scored "0" (No, never) was reached.

TABLE 2

MODIFICATIONS TO VINELAND QUESTIONS

Actual Questions	**Modifications**
Communication Domain	
1. Turns eyes and head toward sound.	How can you tell when your child listens?
5. Raises arms when caregiver says, "Come here" or "Up."	What does your child do when you call his/her name or when you want to pick your child up?
8. Demonstrates understanding of the meaning of at least 10 words.	Does your child gesture appropriately for 10 items? For example, when dressing will he/she move or look at the body part requested?
14. Uses first names or nicknames of siblings, friends, or peers, or states their names when asked.	Does your child differentiate vocalizations when labeling significant people or animals in his/her environment?
15. Uses phrases containing a noun and a verb, or two nouns.	Does your child use any two word or two gesture combinations?
20. Spontaneously relates experiences in simple terms.	How does your child tell you what happened at school or in the past?
Socialization Domain	
14. Imitates simple adult movements, such as clapping hands or waving good-bye, in response to a model.	Does your child imitate motorically appropriate actions in response to a model? For example, blinking eyes or swinging feet?.
23. Says "please" when asking for something.	Does your child gesture for "please" when asking for something?
24. Labels happiness, sadness, fear, and anger in self.	Does your child use gestures or sign language to label happiness, sadness, fear and anger in his/her self?

Lastly, this examiner introduced the Peabody Picture Vocabulary Test- Revised format to each subject. Four instant Polaroid photos of familiar people or objects in the home were taken and used to assess method, latency, and reliability of each subject's response before the modified format PPVT-R was administered. This examiner asked each informant (mother) to designate four items in the home that each child would clearly know the label or name. Most often, Polaroid photos of siblings, family pets, or the subject's adaptive equipment (i.e. wheelchair or walker) were used.

Next, the four pictures of familiar objects were displayed in rows and column of two by two on an appropriate surface (i.e. table, floor, lap tray, or clipboard) corresponding to the optimal positioning of each subject whether sitting in a wheelchair, at a table, or on the floor. Each subject was then asked to point to the one picture from the set of four, either through hand pointing or eye gaze, that most accurately depicted the stimulus word provided. The photos were rearranged in a different format after each trial. Each response was positively reinforced either by verbal praise, touch, clapping, or a thumbs-up sign, in order to enhance the maintenance of attention and motivation to

the task. The direct administration of the PPVT-R was initiated once the child demonstrated reliable responses using the Polaroid photos on five out of five trials.

The example stimuli provided in the PPVT-R series of plates were administered in order to train the subjects to the task using the modified size format. Once reliable responses were obtained for the example stimuli the direct assessment was initiated. This examiner administered the assessment, per Peabody protocol, until a basal of the highest eight consecutive correct responses and a ceiling of the lowest eight consecutive responses containing six errors was obtained for all subjects.

RELIABILITY

A certified Speech and Language Pathologist with experience in administering both the VABS and PPVT-R accompanied this examiner to 13% of the sessions used in this study. The trained examiner scored along with this examiner during the in-home sessions. The inter-rater reliability was found to be 100% for the VABS administration and 97.5% for the PPVT-R. This reliability rating included one subject who used eye gaze and another who used finger pointing as their method of indication during the direct assessment.

Each subject was assigned a severity level based on existing motor impairment using the descriptive guidelines proposed by Rusk (1977). Another examiner, familiar with each subject and Rusk's guidelines, grouped each subject into the categories of mild, moderate, and severe. Both examiners agreed on the category for 13 out of 15 subjects which yielded an inter-rater reliability score of 87%.

STATISTICAL ANALYSIS

The Spearman correlation coefficient (Woods, et. al., 1986) was used to determine the relationship between variables for questions one, two, and three. The Spearman correlation coefficient can solely be used "as a test statistic for testing the hypothesis that two variables are independent of one another [and was] designed to cope with data sets which are not normally distributed" (Woods et. al., p. 173). The first question attempted to examine parent report versus direct assessment as a reliable and valid clinical tool. Questions two and three attempted to examine the relationship between motor skills and receptive communication skills as measured by the VABS and PPVT-R. Significance of the relationship was established by an alpha value of .05 using the SYSTAT program.

Two separate one-way analyses of variance (ANOVA) (Woods, et. al. 1986) were performed to determine explicit differences between variables, receptive language and vocabulary skills, among the different severity levels of motor impairment (See Table 3). An ANOVA format for analysis is typically used to compare several means simultaneously "according to a single (hence 'one-way') criterion variable" (Woods, et. al., p. 197).

TABLE 3

ANOVA MODELS TO BE USED IN ANALYSIS

Severity	**VABS- Receptive Language Quotient**
Mild	
Moderate	
Severe	

Severity	**PPVT-R- Receptive Vocabulary Quotient**
Mild	
Moderate	
Severe	

CHAPTER IV

RESULTS AND DISCUSSION

RESULTS

Results of the present study were analyzed through the use of Spearman correlation coefficients and two one-way measures of analysis of variance (ANOVA).

Review of the Research Questions

1) Does a significant relationship exist between the receptive communication age equivalent obtained through parent interview (VABS) and the receptive vocabulary age equivalent obtained through direct assessment (PPVT-R)?

2) Does a significant relationship exist between the motor skills age equivalent and the receptive communication age equivalent, both obtained through parent interview (VABS)?

3) Does a significant relationship exist between the motor skills standard score obtained through parent interview (VABS) and the receptive vocabulary standard score obtained through direct assessment (PPVT-R)?

4) Do significant differences exist among the different diagnostic categories of motor impairment in terms of the receptive communication developmental quotient (VABS) and the receptive vocabulary standard score (PPVT-R)?

Descriptive Results

The results of this study are displayed in two tables in order to separate the data from the assessments which provide standard scores from those which provide age equivalents.

Table 4 contains the means, standard deviations, and ranges for each group (mild, moderate, and severe) and for the PPVT-R receptive vocabulary standard scores and VABS motor skills standard scores.

Table 5 contains the means, standard deviations, and ranges for each group (mild, moderate, and severe) and for the PPVT-R receptive vocabulary age equivalent, VABS receptive communication age equivalent, and VABS motor skills age equivalent.

TABLE 4

GROUP DESCRIPTIVE STATISTICS AND STANDARD SCORES

Group	Age (mo.) mean (s. d.) [range]	PPVT-R (SS) mean (s. d.) [range]	VABS Motor (SS) mean (s. d.) [range]
Mild n = 2	68 (0) [68 - 68]	83 (1.41) [82 - 84]	92.5 (31.82) [70 -115]
Moderate n = 7	51 (9.83) [37 -62]	74.43 (24.3) [39 - 108]	48.29 (9.91) [38 - 67]
Severe n = 6	52.83 (15.04) [37 - 72]	60.33 (17.95) [39 - 79]	31.67 (14.49) [19 - 58]

TABLE 5

GROUP DESCRIPTIVE STATISTICS AND AGE EQUIVALENTS

Group	PPVT-R (AE) mean (s. d.) [range]	VABS * (AE) Receptive mean (s. d.) [range]	VABS Motor (AE) mean (s. d.) [range]
Mild n = 2	52 (2.83) [50 - 54]	47 (0) [47 - 47]	50.5 (6.36) [46 - 55]
Moderate n = 7	36.14 (8.71) [27 - 50]	37.43 (12.45) [18 - 47]	19.57 (4.31) [14 - 28]
Severe n = 6	31.17 (9.41) [23 - 49]	22.5 (3.99) [18 - 30]	9.17 (9.45) [3 - 28]

* No Standard Score Provided

Spearman Correlation Results

A Spearman correlation coefficient was performed in order to examine the the strength of the relationship between the measures described in research questions one, two and three.

In regards to question one, parent report (VABS receptive communication age equivalent) vs. direct assessment (PPVT-R receptive vocabulary age equivalent) of receptive communication skills, the statistical analysis determined a

positive relationship among the two methods of assessment. A correlation coefficient of 0.6497 and p-value of 0.009 was obtained, thus the null hypothesis was rejected.

Statistical analysis of question two, receptive communication age equivalent (VABS) vs. motor skills age equivalent (VABS), resulted in a correlation coefficient of 0.3982 and p-value of 0.142. No significant relationship between the variables was obtained so the null hypothesis was not rejected.

The relationship between the receptive vocabulary standard score (PPVT-R) and motor skills standard score (VABS) in question three was not found to be statistically significant. A correlation coefficient of 0.4668 and p-value of 0.079 was obtained, therefore the null hypothesis was not rejected.

Two one-way measures of analysis (ANOVA) were performed in order to examine whether or not a significant difference existed, among the categories of motor impairment in terms of receptive communication (VABS) and receptive vocabulary scores (PPVT-R). There were three levels of severity: mild, moderate, and severe. One ANOVA examined the effect of this variable on the dependent variable receptive vocabulary standard score (PPVT-R). The second one-way

ANOVA examined the effect of severity level on receptive communication developmental quotient (VABS). A standard score was not available for the Receptive Communication section of the VABS, however an age equivalent was reported. This examiner derived the developmental quotient used in the analysis for question number four from a ratio consisting of the VABS age equivalent divided by the real age of the subject (i.e. age equivalent (25) / real age (40) = .62 X 100 = developmental quotient of 62).

A post-hoc F - test indicated no statistically significant difference among the three severity groups (mild, moderate, severe) in terms of receptive vocabulary standard scores (PPVT-R) (F Prob. = .3334). Similar results were obtained when a post-hoc F - test was run on the dependent variable of the receptive communication developmental quotient (VABS). No statistically significant differences existed between the groups (F Prob. = .1234). The null hypothesis was not rejected for question four, indicating there were no significant differences among the groups based on motor impairment in terms of receptive communication or receptive vocabulary scores.

DISCUSSION

The results of this study indicate that parent report/interview is a reliable means for assessing the receptive communication skills of children with cerebral palsy when compared to direct assessment. Assessment using parent report can save professionals an abundance of time which would have been previously spent adapting test materials and administering test items keeping in mind each child's unique mode of indication and latency of response. Additionally, a parent interview format provides the professional with a vast amount of information in a short period of time from a trained observer (the parent) who knows the child best and can read his/her intentions through any obvious motor difficulties. In fact, a parent interview could be accomplished over the telephone making a clinic visit virtually unnecessary.

This examiner found no significant differences in the receptive communication skills of the preschool-aged children with cerebral palsy based on their levels of severity of motor impairment. Thus, it is to be concluded, in terms of the sample studied, that motor abilities or disabilities do not necessarily reflect underlying receptive language and vocabulary skills.

Therefore, it is not in the best interest of the child for his/her communicative partners to assume the child's level of understanding language based on obvious motor impairments.

CHAPTER V

SUMMARY AND IMPLICATIONS

SUMMARY

The purpose of this study was to determine whether or not parent interview/report is a reliable means of assessing receptive communication skills in preschool-aged children with cerebral palsy. Additionally, the relationship between motor skills and receptive language skills were examined. The subject pool was comprised of fifteen children, 10 males and 5 females, between the ages of three to six years who were participating in a longitudinal study at Portland State University. Each subject and his/her mother participated in a two and a half hour in-home assessment session. A physical therapy student accompanied this examiner to the subject's homes in order to address positioning needs before the direct measure was administered. Both the Vineland Adaptive Behavior Scale - Interview Format and the Peabody Picture Vocabulary Test - Revised were administered to each participating subject.

Results revealed that parent report is a valid means for assessing receptive communication skills in the preschool-aged population with cerebral palsy. However, significant differences

based on degrees of motor impairment were not found for the development of receptive language skills in this population.

CLINICAL IMPLICATIONS

The use of a parent report measures such as the VABS was found to yield valid results in the assessment of receptive language skills in children with cerebral palsy when compared to direct assessment. It was found that the parents of children with cerebral palsy are reliable reporters of their child's receptive language skills and did not tend to exaggerate or provide false information to this examiner. This finding further supports the contention that professionals need to either provide a modified direct assessment or a parent report measure in order to obtain a valid representation of skills when assessing children with motor impairments. Additionally, it has been documented by this study that motor skills do not necessarily imply underlying receptive language skills.

Although this study discovered that parents are reliable reporters of receptive communication skills, the Light, Collier, and Parnes (1985) study found that parents of children with cerebral palsy were less responsive to their child's communicative intentions. Parent training in the area of

responsiveness could enhance the parent-child communicative interaction and assist parents in using what they know about their child's language skills in order to support further communication development.

It is very important to evaluate receptive language in this population before planning intervention since motor dysfunction can potentially mask underlying skills. Speech and language pathologists run the risk of limiting language growth in children with motor impairments when providing augmentative or alternative communication devices without first evaluating current levels of comprehension.

Parent and caregiver training should focus on providing the child with an appropriate language model based on receptive, not expressive, language skills. Speech and language pathologists can assess the receptive communication level of the child and provide parents with suggestions regarding appropriate stimulation activities at that level. Intervention is most effective when the parents are provided with information regarding the philosophies behind the intervention techniques (Carlson, 1987). This information can enable parents to problem solve and develop techniques and strategies that are functional

within the home setting (Carlson, 1987). An open-forum for communication should be maintained which encourages parents to discuss difficulties, successes, and ongoing needs with the clinician (Carlson, 1987). Speech and language pathologists can work jointly with parents and caregivers to enhance the development of receptive communication skills in the population with motor impairments.

RESEARCH IMPLICATIONS

Normative data regarding communication development, expressive and receptive, in children with cerebral palsy is not available as yet. The first step towards obtaining this valuable information is to develop valid assessment instruments that are not tainted by primitive reflexes and/or motor dysfunction. Obtaining and assessing a national standardized sample will be a time-consuming process, however, the results of this study indicate the reliability of parent report which, in effect, can expedite the process of data collection.

Although the results of this study did not document specific trends in motor skills and receptive communication development, further research using a larger sample size in each category of severity may uncover significant differences among

the moderate and severe groups. Trends may exist across the severity levels of motor impairment. Such a trend is suggested by the observation (See Tables 4 & 5) that scores on the PPVT and VABS receptive subscale are at least one standard deviation higher in the moderate than the severe group. A larger sample might have identified a significant difference between these variables.

This information could not only assist professionals in providing parents with appropriate intervention strategies and techniques, but could also provide parents with a "map of developmental milestones." Thus the parents and caregivers could provide the child with a language model at or slightly above the child's current level of functioning based on the normative information. The provision of appropriate language models will allow the child to constantly move forward in his/her communication development without stagnating at a lower level of functioning. The effect of communication development will enhance the growth of the child, including but not limited to, the areas of cognition and socialization.

REFERENCES

Bates, E., Bretherton, I. & Snyder, L. (1988). From first words to grammar : individual differences and dissociable mechanisms. New York: C.U.P.

Berninger, V. W., & Gans, B. M. (1986). Language profiles in nonspeaking individuals of normal intelligence with severe cerebral palsy. AAC Augmentative and Alternative Communication, 5, 45-50.

Bishop, D. V. M., Brown, B. B., & Robson, J. (1990). The relationship between phoneme discrimination, speech production, and language comprehension in cerebral-palsied in Bloom, F. E., & Lazerson, A. (1985). Brain, Mind, and Behavior: Second Edition. New York: W. H. Freeman and Company.

Boone, D. R. (1987). Human Communication and Its Disorders. New Jersey: Prentice-Hall, Inc.

Carlson, F. (1987). Communication strategies for infants. In E. McDonald, Treating Cerebral Palsy: For Clinicians by Clinicians. Austin, Texas: PRO-ED, Inc.

Dunn, L.M., & Dunn, L.M. (1981). Peabody Picture Vocabulary Test- Revised. Circle Pines, MN: American Guidance Service.

Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. J., & Pethick, S. J. (1994). Variability in early communicative development. Monographs of the Society for Research in Child Development, 59, 1 - 174.

Johnson-Martin, N. M., Wolters, P., & Stowers, S. (1987). Psychological assessment of the nonvocal, physically handicapped child. Physical and Occupational Therapy in

Pediatrics, 7, 23-38.

Kraat, A. (1991). Methodological issues in the study of language development for children using AAC systems. In J. Brodin & E. Bjorck-Akesson (Eds.), Methodological Issues in Research in Augmentative and Alternative Communication: Proceedings from the First ISAAC Research Symposium in Augmentative and Alternative Communication. Stockholm: Swedish Handicap Institute.

Light, J., Collier, B., and Parnes, P. (1985a). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part I-Discourse patterns. AAC Augmentative and Alternative Communication, 1, p. 74-83.

Light, J., Collier, B., and Parnes, P. (1985b). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part II-Communicative functions. AAC Augmentative and Alternative Communication, 1, p. 98-107.

Light, J., Collier, B., and Parnes, P. (1985c). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part III-Modes of communication. AAC Augmentative and Alternative Communication, 1, p. 125-133.

McDonald, E. T. (1987). Treating Cerebral Palsy: For Clinicians by Clinicians. Austin, Texas: PRO-ED, Inc.

McNaughton, S. (1993). Graphic representational systems and literacy learning. Topics in Language Disorders, 13, p. 58-75.

Minear, W. L. (1956). A classification of cerebral palsy. Pediatrics, 28, 841-852.

O'Reilly, D. E., & Walentynowicz, J. E. (1981). Etiological factors in cerebral palsy: An historical review. Developmental Medicine and Child Neurology, 23, 633-642.

Parker, L. G. (1987). Educational Programming. In E. McDonald, Treating Cerebral Palsy: For Clinicians by Clinicians. Austin, Texas: PRO-ED, Inc.

Piaget, J., & Inhelder, B. (1969). The Psychology of the Child. New York: Basic Books.

Piaget, J. (1952). The Origins of Intelligence in Children. New York: Basic Books.

Rusk, H. (1977). Rehabilitation medicine (4th ed.). St. Louis: C. V. Mosby.

Schleichkorn, J. (1983). Coping with cerebral palsy. Austin, Texas: PRO-ED.

Soriano, D., Paul, R., & Cohen, D. J. (1988). A report on adaptive behavioral outcomes in adolescents with developmental language disorders. NSSLHA Journal,16, 106-114.

Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (1984). Vineland Adaptive Behavior Scales. Circle Pines, MN.: AGS.

Woods, A., Fletcher, P., & Hughes, A. (1986). Statistics in language studies. Cambridge: Cambridge University Press.

APPENDIX A

HUMAN SUBJECTS COMMITTEE APPROVAL

OFFICE OF GRADUATE STUDIES AND RESEARCH
Research and Sponsored Projects

DATE: December 2, 1996

TO: **Susan Livick** SSN#: 571-85-0726

FROM: for Vikki Vandiver, Chair, HSRRC, 1996-97

RE: HSRRC Waived Review of Your Application titled, "First Language Acquisition in Children with Severe Speech Production Impairments Using Alternative Communication Systems."

Your proposal is exempt from further HSRRC review, and you may proceed with the study.

Even with the exemption above, it was necessary by University policy for you to notify this Committee of the Proposed research and we appreciate your timely attention to this matter. If you make changes in your research protocol, the Committee must be notified. This approval is valid for one year from date of issue.

c: Maureen Orr Eldred
Rhea Paul, Project Advisor

APPENDIX B

CONSENT FORM

PORTLAND STATE UNIVERSITY

CONSENT FORM: FOR PARTICIPATING IN A STUDY OF COGNITIVE AND LANGUAGE CHARACTERISTICS OF CHILDREN WITH SEVERE SPEECH IMPAIRMENTS

I _____ agree to allow my child _____ to take part in the research conducted by Dr. Rhea Paul on the development of language in children with severe speech production impairments. I understand that the study involves giving standard tests and clinical assessments, including parent interviews, designed to evaluate the hearing and understanding, vocal abilities, motor abilities, play, cognitive, social and adaptive skills of young children with severe speech impairments and compare them to those of normally developing peers. I also understand that the study may involve videotaping me and my child to look at how mothers interact with children with speech impairments and compare these interactions to those of mothers with normally speaking children. If my child is involved in an intervention program, the study may also involve videotaping my child with the clinician to look at the way that clinicians talk to children with severe speech impairments.

I understand that the study will take several hours of my and my child's time, some of which will take place in our home, and some may take place in my child's clinical setting or at PSU. Dr. Paul has told me that the purpose of the study is to learn more about how children who cannot talk learn to understand and communicate, and that this knowledge can help develop better ways to teach language skills to these children. I understand that my child may not receive any direct benefit from participating in the study, however.

Dr. Paul has agreed to answer any questions I have about the study and what I am expected to do. I understand that all information collected about my child in the study will remain confidential to the extent permitted by law, and that the names of all the people in the study will be kept confidential. I understand that I do not have to take part in this study, and my decision will not affect any services my child receives. If I choose to participate, I may withdraw at any time.

I have read and understand the above information and agree to allow my child to take part in this study.

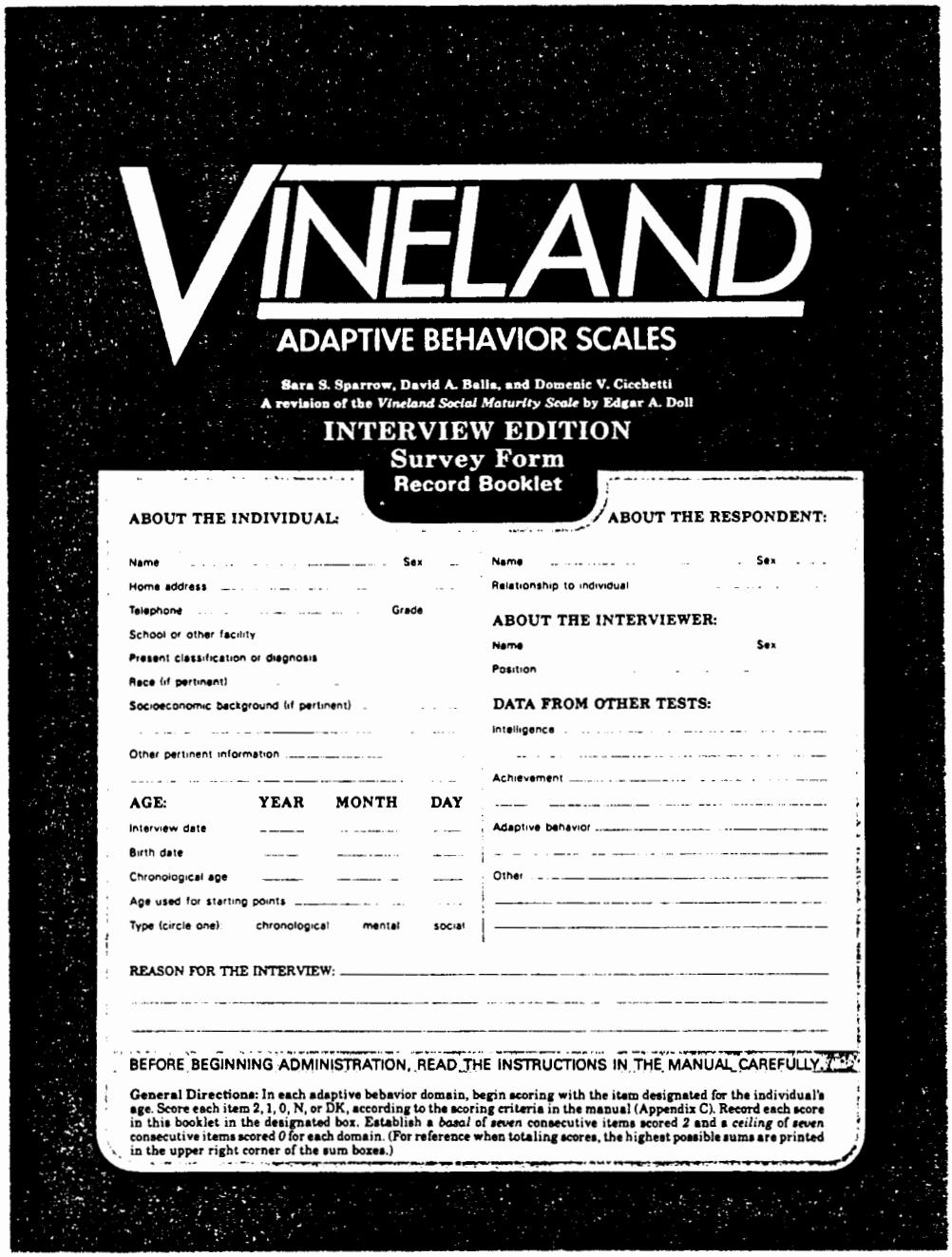
Date:_____ Signature: _____

Please keep one copy of this permission form yourself and return one to Susan. If you have concerns or questions about the study please contact Dr. Paul at 725-3142 or the Chair of the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 105 Neuberger Hall, Portland State University, 503/725-3417.

COLLEGE OF LIBERAL ARTS & SCIENCES • DEPARTMENT OF SPEECH COMMUNICATION • SPEECH & HEARING SCIENCES PROGRAM
POST OFFICE BOX 751 • PORTLAND, OREGON 97207-0751 • (503) 725-3150 • FAX (503) 725-3165

APPENDIX C

VINELAND ADAPTIVE BEHAVIOR SCALES - INTERVIEW EDITION



VINELAND

ADAPTIVE BEHAVIOR SCALES

Sara S. Sparrow, David A. Balla, and Domenic V. Cicchetti
A revision of the *Vineland Social Maturity Scale* by Edgar A. Doll

INTERVIEW EDITION

Survey Form
Record Booklet

ABOUT THE INDIVIDUAL:

Name ..... Sex ...
Home address .....
Telephone ..... Grade
School or other facility
Present classification or diagnosis
Race (if pertinent)
Socioeconomic background (if pertinent) .....
.....
Other pertinent information .....
.....

AGE:	YEAR	MONTH	DAY
Interview date			
Birth date			
Chronological age			
Age used for starting points			

Type (circle one) chronological mental social

ABOUT THE RESPONDENT:

Name ..... Sex ...
Relationship to individual .....

ABOUT THE INTERVIEWER:

Name Sex
Position .....

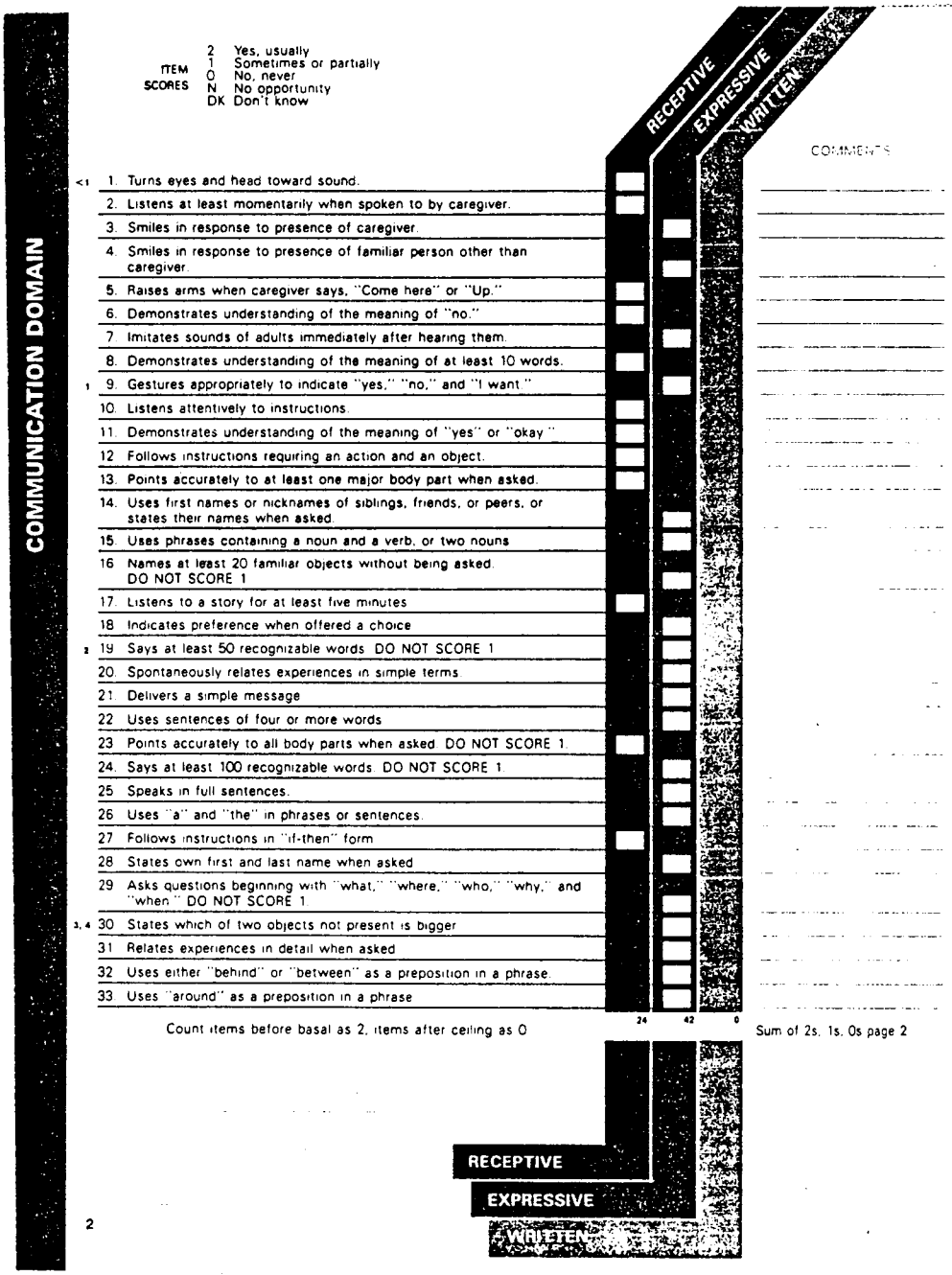
DATA FROM OTHER TESTS:

Intelligence .....
.....
Achievement .....
.....
Adaptive behavior .....
.....
Other .....
.....
.....

REASON FOR THE INTERVIEW: .....
.....
.....

BEFORE BEGINNING ADMINISTRATION, READ THE INSTRUCTIONS IN THE MANUAL CAREFULLY.

General Directions: In each adaptive behavior domain, begin scoring with the item designated for the individual's age. Score each item 2, 1, 0, N, or DK, according to the scoring criteria in the manual (Appendix C). Record each score in this booklet in the designated box. Establish a *basal* of *seven* consecutive items scored *2* and a *ceiling* of *seven* consecutive items scored *0* for each domain. (For reference when totaling scores, the highest possible sums are printed in the upper right corner of the sum boxes.)


COMMUNICATION DOMAIN
ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know
RECEPTIVE
EXPRESSIVE
WRITTEN
COMMENTS
<1 1. Turns eyes and head toward sound.
2. Listens at least momentarily when spoken to by caregiver.
3. Smiles in response to presence of caregiver.
4. Smiles in response to presence of familiar person other than caregiver.
5. Raises arms when caregiver says, "Come here" or "Up."
6. Demonstrates understanding of the meaning of "no."
7. Imitates sounds of adults immediately after hearing them.
8. Demonstrates understanding of the meaning of at least 10 words.
1 9. Gestures appropriately to indicate "yes," "no," and "I want."
10. Listens attentively to instructions.
11. Demonstrates understanding of the meaning of "yes" or "okay."
12. Follows instructions requiring an action and an object.
13. Points accurately to at least one major body part when asked.
14. Uses first names or nicknames of siblings, friends, or peers, or states their names when asked.
15. Uses phrases containing a noun and a verb, or two nouns.
16. Names at least 20 familiar objects without being asked. DO NOT SCORE 1.
17. Listens to a story for at least five minutes.
18. Indicates preference when offered a choice.
2 19. Says at least 50 recognizable words. DO NOT SCORE 1.
20. Spontaneously relates experiences in simple terms.
21. Delivers a simple message.
22. Uses sentences of four or more words.
23. Points accurately to all body parts when asked. DO NOT SCORE 1.
24. Says at least 100 recognizable words. DO NOT SCORE 1.
25. Speaks in full sentences.
26. Uses "a" and "the" in phrases or sentences.
27. Follows instructions in "if-then" form.
28. States own first and last name when asked.
29. Asks questions beginning with "what," "where," "who," "why," and "when." DO NOT SCORE 1.
3, 4 30. States which of two objects not present is bigger.
31. Relates experiences in detail when asked.
32. Uses either "behind" or "between" as a preposition in a phrase.
33. Uses "around" as a preposition in a phrase.
24
42
0
Count items before basal as 2, items after ceiling as 0
Sum of 2s, 1s, 0s page 2
RECEPTIVE
EXPRESSIVE
WRITTEN
2

ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know

COMMUNICATION DOMAIN

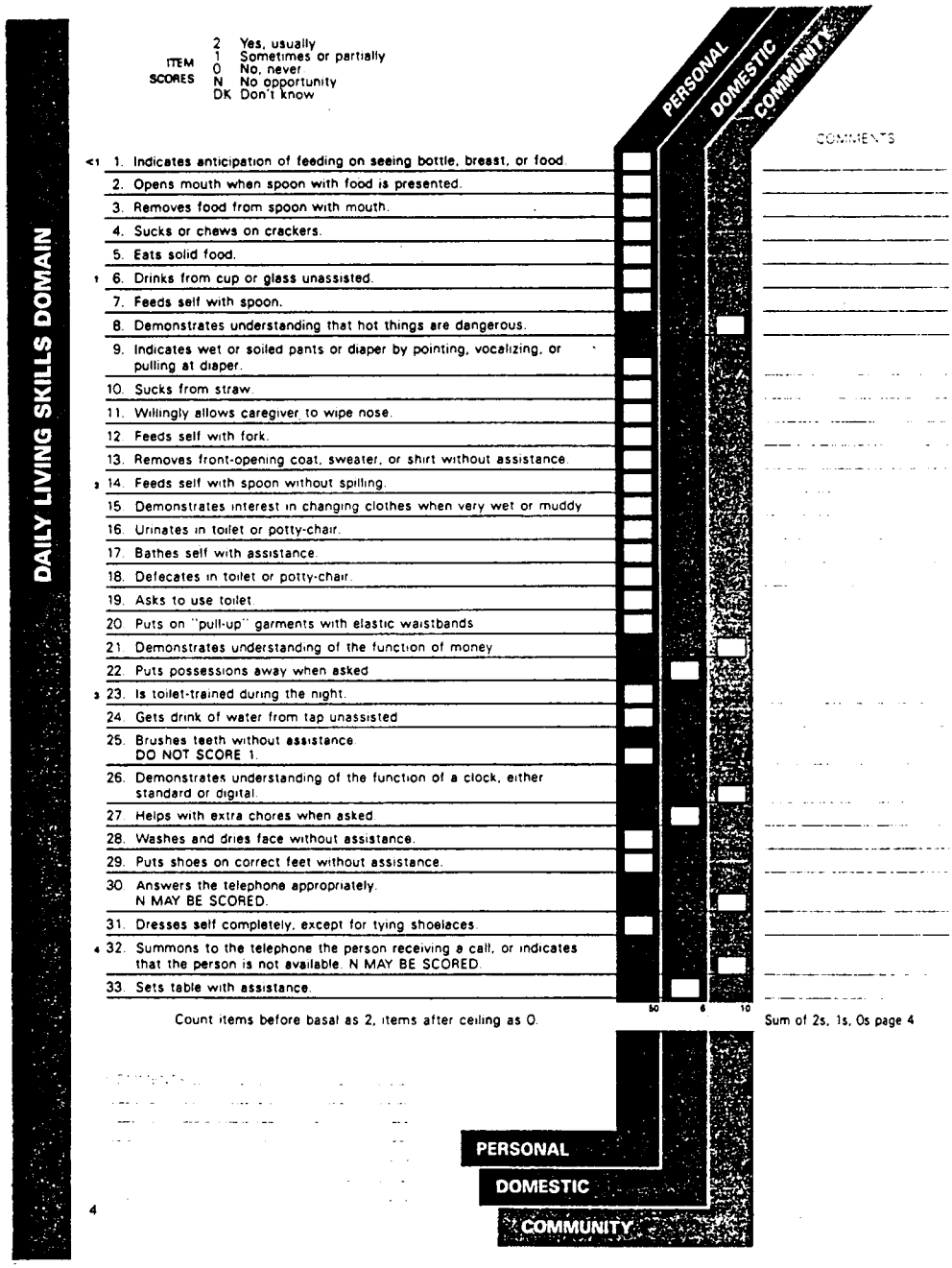
		RECEPTIVE	EXPRESSIVE	WRITTEN	COMMENTS
	34. Uses phrases or sentences containing "but" and "or"				
	35. Articulates clearly, without sound substitutions.				
	36. Tells popular story, fairy tale, lengthy joke, or television show plot.				
6	37. Recites all letters of the alphabet from memory.				
	38. Reads at least three common signs.				
	39. States month and day of birthday when asked.				
	40. Uses irregular plurals.				
6	41. Prints or writes own first and last name.				
	42. States telephone number when asked. N MAY BE SCORED.				
	43. States complete home address, including city and state, when asked.				
	44. Reads at least 10 words silently or aloud.				
	45. Prints or writes at least 10 words from memory.				
	46. Expresses ideas in more than one way, without assistance.				
	47. Reads simple stories aloud.				
7, 8	48. Prints or writes simple sentences of three or four words.				
	49. Attends to school or public lecture more than 15 minutes.				
	50. Reads on own initiative.				
	51. Reads books of at least second-grade level.				
	52. Arranges items or words alphabetically by first letter.				
	53. Prints or writes short notes or messages.				
9	54. Gives complex directions to others.				
	55. Writes beginning letters. DO NOT SCORE 1.				
	56. Reads books of at least fourth-grade level.				
	57. Writes in cursive most of the time. DO NOT SCORE 1.				
10 to 18+	58. Uses a dictionary.				
	59. Uses the table of contents in reading materials.				
	60. Writes reports or compositions. DO NOT SCORE 1.				
	61. Addresses envelopes completely.				
	62. Uses the index in reading materials.				
	63. Reads adult newspaper stories. N MAY BE SCORED.				
	64. Has realistic long-range goals and describes in detail plans to achieve them.				
	65. Writes advanced letters.				
	66. Reads adult newspaper or magazine stories each week. N MAY BE SCORED.				
	67. Writes business letters. DO NOT SCORE 1.				

Count items before basal as 2, items after ceiling as 0

1	2 20 48	Sum of 2s, 1s, 0s page 3
2		Sum of 2s, 1s, 0s page 2
3		Number of Ns pages 2 and 3
4		Number of DKs pages 2 and 3
	26 82 46	SUBDOMAIN RAW SCORE (Add rows 1—4 above)

RECEPTIVE
EXPRESSIVE
WRITTEN

3


DAILY LIVING SKILLS DOMAIN
ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know
PERSONAL
DOMESTIC
COMMUNITY
COMMENTS
<1 1. Indicates anticipation of feeding on seeing bottle, breast, or food.
2. Opens mouth when spoon with food is presented.
3. Removes food from spoon with mouth.
4. Sucks or chews on crackers.
5. Eats solid food.
1 6. Drinks from cup or glass unassisted.
7. Feeds self with spoon.
8. Demonstrates understanding that hot things are dangerous.
9. Indicates wet or soiled pants or diaper by pointing, vocalizing, or pulling at diaper.
10. Sucks from straw.
11. Willingly allows caregiver to wipe nose.
12. Feeds self with fork.
13. Removes front-opening coat, sweater, or shirt without assistance.
2 14. Feeds self with spoon without spilling.
15. Demonstrates interest in changing clothes when very wet or muddy.
16. Urinates in toilet or potty-chair.
17. Bathes self with assistance.
18. Defecates in toilet or potty-chair.
19. Asks to use toilet.
20. Puts on "pull-up" garments with elastic waistbands.
21. Demonstrates understanding of the function of money.
22. Puts possessions away when asked.
3 23. Is toilet-trained during the night.
24. Gets drink of water from tap unassisted.
25. Brushes teeth without assistance. DO NOT SCORE 1.
26. Demonstrates understanding of the function of a clock, either standard or digital.
27. Helps with extra chores when asked.
28. Washes and dries face without assistance.
29. Puts shoes on correct feet without assistance.
30. Answers the telephone appropriately. N MAY BE SCORED.
31. Dresses self completely, except for tying shoelaces.
4 32. Summons to the telephone the person receiving a call, or indicates that the person is not available. N MAY BE SCORED.
33. Sets table with assistance.
50
6
10
Count items before basal as 2, items after ceiling as 0.
Sum of 2s, 1s, 0s page 4
PERSONAL
DOMESTIC
COMMUNITY
4

ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know

PERSONAL | DOMESTIC | COMMUNITY

COMMENTS

34. Cares for all toileting needs, without being reminded and without assistance. DO NOT SCORE 1.
35. Looks both ways before crossing street or road.
36. Puts clean clothes away without assistance when asked.
37. Cares for nose without assistance. DO NOT SCORE 1.
38. Clears table of breakable items.
39. Dries self with towel without assistance.
40. Fastens all fasteners. DO NOT SCORE 1.
• 41. Assists in food preparation requiring mixing and cooking.
42. Demonstrates understanding that it is unsafe to accept rides, food, or money from strangers.
43. Ties shoelaces into a bow without assistance.
44. Bathes or showers without assistance. DO NOT SCORE 1.
45. Looks both ways and crosses street or road alone.
46. Covers mouth and nose when coughing and sneezing.
• 47. Uses spoon, fork, and knife competently. DO NOT SCORE 1.
48. Initiates telephone calls to others. N MAY BE SCORED.
49. Obeys traffic lights and Walk and Don't Walk signs. N MAY BE SCORED.
50. Dresses self completely, including tying shoelaces and fastening all fasteners. DO NOT SCORE 1.
51. Makes own bed when asked.
52. States current day of the week when asked.
53. Fastens seat belt in automobile independently. N MAY BE SCORED.
7 54. States value of penny, nickel, dime, and quarter.
55. Uses basic tools.
56. Identifies left and right on others.
57. Sets table without assistance when asked.
• 58. Sweeps, mops, or vacuums floor carefully, without assistance, when asked.
59. Uses emergency telephone number in emergency. N MAY BE SCORED.
60. Orders own complete meal in restaurant. N MAY BE SCORED.
61. States current date when asked.
62. Dresses in anticipation of changes in weather without being reminded.
63. Avoids persons with contagious illnesses, without being reminded.

22 | 14 | 24

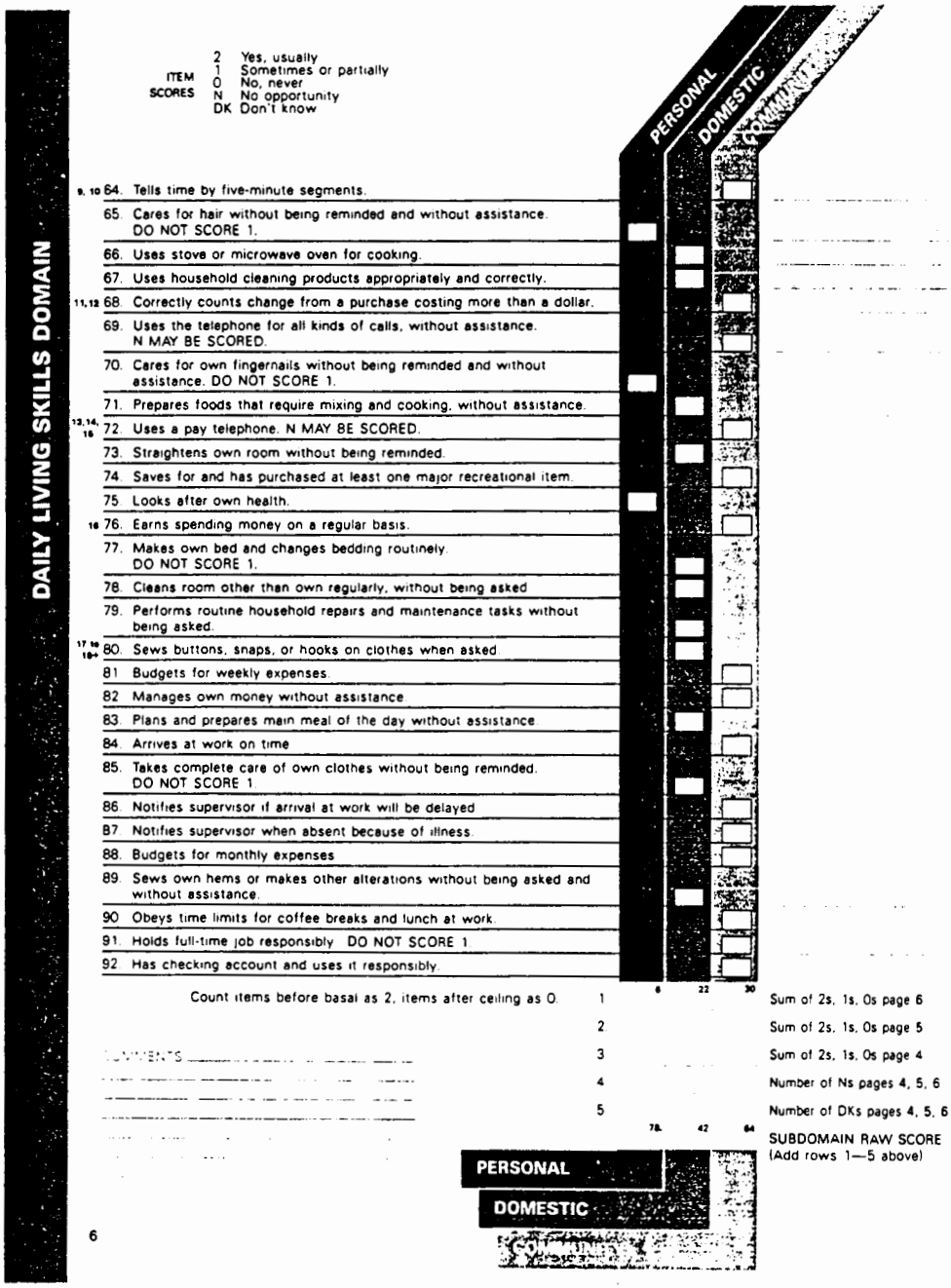
Count items before basal as 2, items after ceiling as 0.

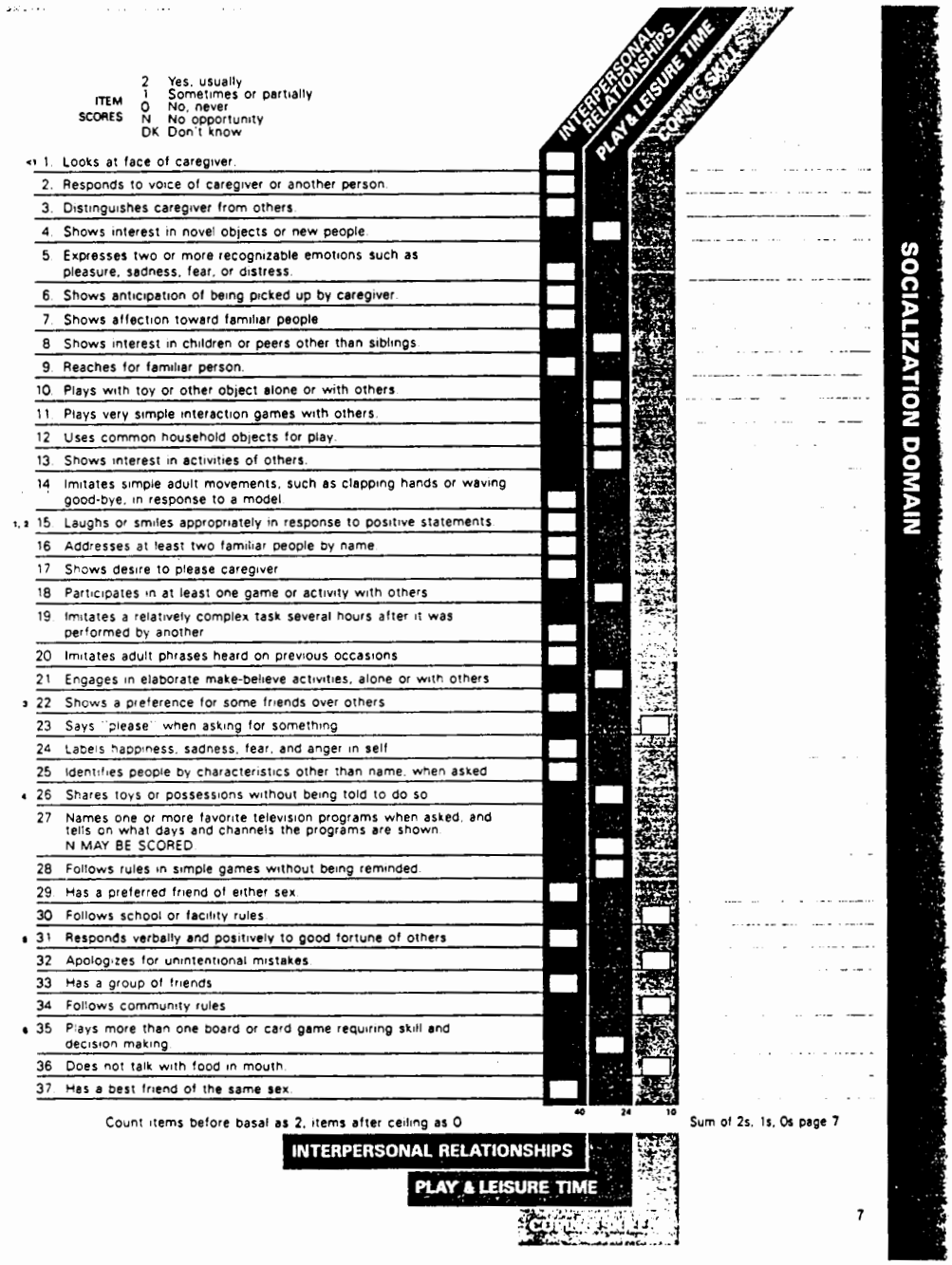
Sum of 2s, 1s, 0s page 5

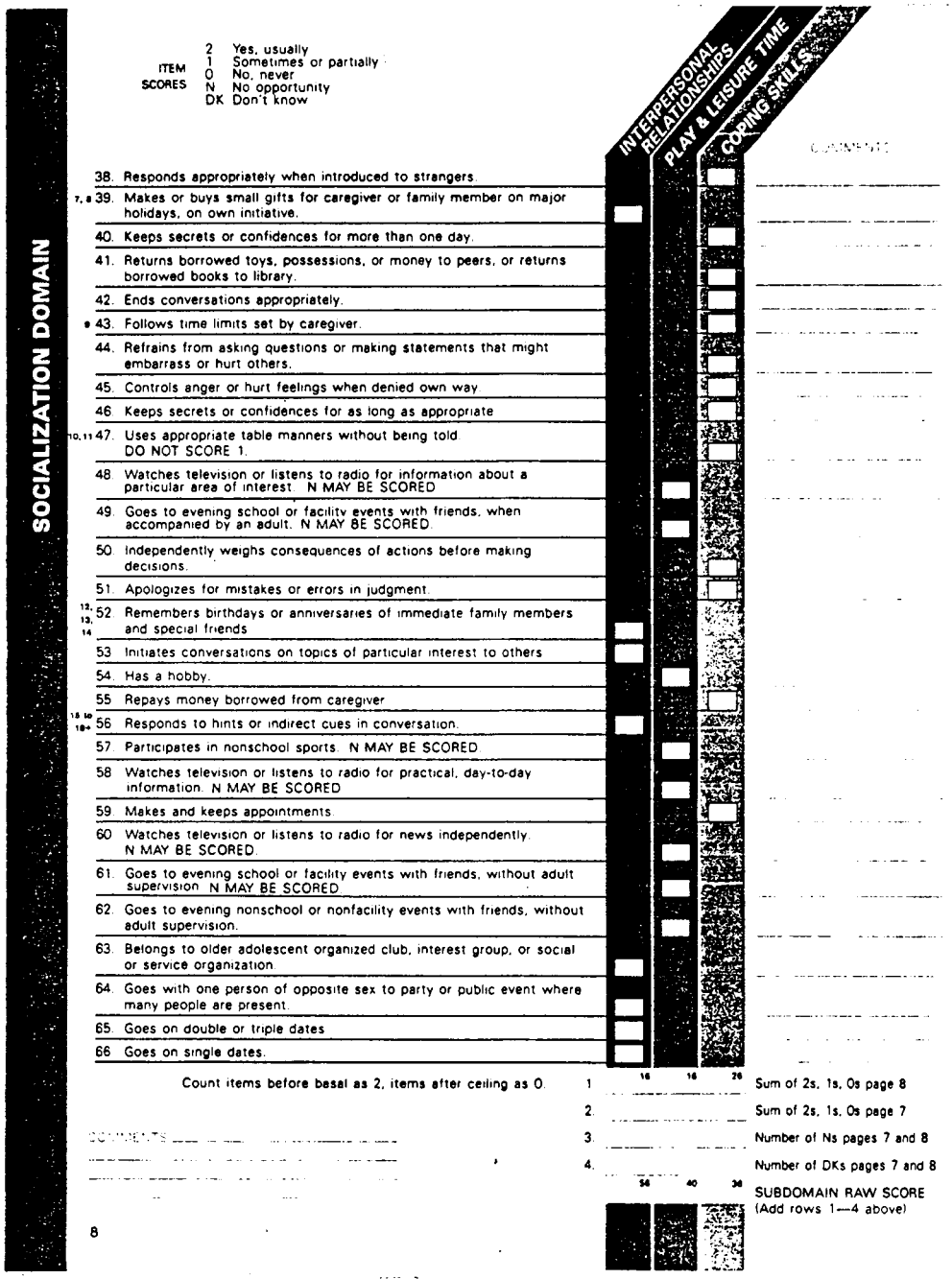
PERSONAL
DOMESTIC
COMMUNITY

5

DAILY LIVING SKILLS DOMAIN


DAILY LIVING SKILLS DOMAIN
ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know
PERSONAL
DOMESTIC
COMMUNITY
9, 10 64. Tells time by five-minute segments.
65. Cares for hair without being reminded and without assistance. DO NOT SCORE 1.
66. Uses stove or microwave oven for cooking.
67. Uses household cleaning products appropriately and correctly.
11,12 68. Correctly counts change from a purchase costing more than a dollar.
69. Uses the telephone for all kinds of calls, without assistance. N MAY BE SCORED.
70. Cares for own fingernails without being reminded and without assistance. DO NOT SCORE 1.
71. Prepares foods that require mixing and cooking, without assistance.
13,14, 15 72. Uses a pay telephone. N MAY BE SCORED.
73. Straightens own room without being reminded.
74. Saves for and has purchased at least one major recreational item.
75. Looks after own health.
16 76. Earns spending money on a regular basis.
77. Makes own bed and changes bedding routinely. DO NOT SCORE 1.
78. Cleans room other than own regularly, without being asked.
79. Performs routine household repairs and maintenance tasks without being asked.
17, 18 18+ 80. Sews buttons, snaps, or hooks on clothes when asked.
81. Budgets for weekly expenses.
82. Manages own money without assistance.
83. Plans and prepares main meal of the day without assistance.
84. Arrives at work on time.
85. Takes complete care of own clothes without being reminded. DO NOT SCORE 1.
86. Notifies supervisor if arrival at work will be delayed.
87. Notifies supervisor when absent because of illness.
88. Budgets for monthly expenses.
89. Sews own hems or makes other alterations without being asked and without assistance.
90. Obeys time limits for coffee breaks and lunch at work.
91. Holds full-time job responsibly. DO NOT SCORE 1.
92. Has checking account and uses it responsibly.
8
22
30
Count items before basal as 2, items after ceiling as 0.
1 Sum of 2s, 1s, 0s page 6
2 Sum of 2s, 1s, 0s page 5
3 Sum of 2s, 1s, 0s page 4
4 Number of Ns pages 4, 5, 6
5 Number of DKs pages 4, 5, 6
78
42
64
SUBDOMAIN RAW SCORE (Add rows 1—5 above)
COMMENTS
PERSONAL
DOMESTIC
6


INTERPERSONAL RELATIONSHIPS
PLAY & LEISURE TIME
COPING SKILLS
SOCIALIZATION DOMAIN
ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know
1. Looks at face of caregiver.
2. Responds to voice of caregiver or another person.
3. Distinguishes caregiver from others.
4. Shows interest in novel objects or new people.
5. Expresses two or more recognizable emotions such as pleasure, sadness, fear, or distress.
6. Shows anticipation of being picked up by caregiver.
7. Shows affection toward familiar people.
8. Shows interest in children or peers other than siblings.
9. Reaches for familiar person.
10. Plays with toy or other object alone or with others.
11. Plays very simple interaction games with others.
12. Uses common household objects for play.
13. Shows interest in activities of others.
14. Imitates simple adult movements, such as clapping hands or waving good-bye, in response to a model.
15. Laughs or smiles appropriately in response to positive statements.
16. Addresses at least two familiar people by name.
17. Shows desire to please caregiver.
18. Participates in at least one game or activity with others.
19. Imitates a relatively complex task several hours after it was performed by another.
20. Imitates adult phrases heard on previous occasions.
21. Engages in elaborate make-believe activities, alone or with others.
22. Shows a preference for some friends over others.
23. Says "please" when asking for something.
24. Labels happiness, sadness, fear, and anger in self.
25. Identifies people by characteristics other than name, when asked.
26. Shares toys or possessions without being told to do so.
27. Names one or more favorite television programs when asked, and tells on what days and channels the programs are shown. N MAY BE SCORED.
28. Follows rules in simple games without being reminded.
29. Has a preferred friend of either sex.
30. Follows school or facility rules.
31. Responds verbally and positively to good fortune of others.
32. Apologizes for unintentional mistakes.
33. Has a group of friends.
34. Follows community rules.
35. Plays more than one board or card game requiring skill and decision making.
36. Does not talk with food in mouth.
37. Has a best friend of the same sex.
40
24
10
Count items before basal as 2, items after ceiling as 0
Sum of 2s, 1s, 0s page 7
INTERPERSONAL RELATIONSHIPS
PLAY & LEISURE TIME
7


SOCIALIZATION DOMAIN
ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know
INTERPERSONAL RELATIONSHIPS
PLAY & LEISURE TIME
COPING SKILLS
COMMENTS
38. Responds appropriately when introduced to strangers.
7, a 39. Makes or buys small gifts for caregiver or family member on major holidays, on own initiative.
40. Keeps secrets or confidences for more than one day.
41. Returns borrowed toys, possessions, or money to peers, or returns borrowed books to library.
42. Ends conversations appropriately.
a 43. Follows time limits set by caregiver.
44. Refrains from asking questions or making statements that might embarrass or hurt others.
45. Controls anger or hurt feelings when denied own way.
46. Keeps secrets or confidences for as long as appropriate.
10, 11 47. Uses appropriate table manners without being told. DO NOT SCORE 1.
48. Watches television or listens to radio for information about a particular area of interest. N MAY BE SCORED.
49. Goes to evening school or facility events with friends, when accompanied by an adult. N MAY BE SCORED.
50. Independently weighs consequences of actions before making decisions.
51. Apologizes for mistakes or errors in judgment.
12, 13, 14 52. Remembers birthdays or anniversaries of immediate family members and special friends.
53. Initiates conversations on topics of particular interest to others.
54. Has a hobby.
55. Repays money borrowed from caregiver.
15 to 18+ 56. Responds to hints or indirect cues in conversation.
57. Participates in nonschool sports. N MAY BE SCORED.
58. Watches television or listens to radio for practical, day-to-day information. N MAY BE SCORED.
59. Makes and keeps appointments.
60. Watches television or listens to radio for news independently. N MAY BE SCORED.
61. Goes to evening school or facility events with friends, without adult supervision. N MAY BE SCORED.
62. Goes to evening nonschool or nonfacility events with friends, without adult supervision.
63. Belongs to older adolescent organized club, interest group, or social or service organization.
64. Goes with one person of opposite sex to party or public event where many people are present.
65. Goes on double or triple dates.
66. Goes on single dates.
Count items before basal as 2, items after ceiling as 0.
16 16 26
1. Sum of 2s, 1s, 0s page 8
2. Sum of 2s, 1s, 0s page 7
3. Number of Ns pages 7 and 8
4. Number of DKs pages 7 and 8
56 40 36
SUBDOMAIN RAW SCORE (Add rows 1—4 above)
COMMENTS
8

ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
N No opportunity
DK Don't know

Note. The Motor Skills domain is for individuals 5-11-30 or under, and optional for older individuals for whom a motor deficit is suspected. See Chapters 4 and 5 in the manual for procedures for administering and scoring the Motor Skills domain for individuals 6-0-0 or older.

GROSS FINE

COMMENTS

<1	1. Holds head erect for at least 15 seconds without assistance when held vertically in caregiver's arms.		
	2. Sits supported for at least one minute.		
	3. Picks up small object with hands, in any way.		
	4. Transfers object from one hand to the other.		
	5. Picks up small object with thumb and fingers.		
	6. Raises self to sitting position and maintains position unsupported for at least one minute.		
	7. Crawls across floor on hands and knees, without stomach touching floor.		
	8. Opens doors that require only pushing or pulling.		
1	9. Rolls ball while sitting.		
	10. Walks as primary means of getting around.		
	11. Climbs both in and out of bed or steady adult chair.		
	12. Climbs on low play equipment.		
	13. Marks with pencil, crayon, or chalk on appropriate writing surface.		
2	14. Walks up stairs, putting both feet on each step.		
	15. Walks down stairs, forward, putting both feet on each step.		
	16. Runs smoothly, with changes in speed and direction.		
	17. Opens doors by turning and pulling doorknobs.		
	18. Jumps over small object.		
	19. Screws and unscrews lid of jar.		
	20. Pedals tricycle or other three-wheeled vehicle for at least six feet. N MAY BE SCORED.		
	21. Hops on one foot at least once, while holding on to another person or stable object, without falling.		
	22. Builds three-dimensional structures, with at least five blocks.		
	23. Opens and closes scissors with one hand.		
3, 4+	24. Walks down stairs with alternating feet, without assistance.		
	25. Climbs on high play equipment.		
	26. Cuts across a piece of paper with scissors.		
	27. Hops forward on one foot at least three times without losing balance. DO NOT SCORE 1.		
	28. Completes non-inset puzzle of at least six pieces. DO NOT SCORE 1.		
	29. Draws more than one recognizable form with pencils or crayons.		
	30. Cuts paper along a line with scissors.		
	31. Uses eraser without tearing paper.		
	32. Hops forward on one foot with ease. DO NOT SCORE 1.		
	33. Unlocks key locks.		
	34. Cuts out complex items with scissors.		
	35. Catches small ball thrown from a distance of 10 feet, even if moving is necessary to catch it.		
	36. Rides bicycle without training wheels, without falling. N MAY BE SCORED.		

Count items before basal as 2, items after ceiling as 0.

1.		40	32
2.			
3.		40	32

1. Sum of 2s, 1s, 0s page 9
2. Number of Ns page 9
3. Number of DKs page 9

SUBDOMAIN RAW SCORE (Add rows 1—3 above)

GROSS

FINE

9

MOTOR SKILLS DOMAIN

MALADAPTIVE BEHAVIOR DOMAIN

Note: The Maladaptive Behavior domain is for individuals 5-0-0 or older. Administration is optional.

ITEM SCORES
2 Yes, usually
1 Sometimes or partially
0 No, never
DO NOT SCORE N OR DK.

PART 1

1. Sucks thumb or fingers.
2. Is overly dependent.
3. Withdraws.
4. Wets bed.
5. Exhibits an eating disturbance.
6. Exhibits a sleep disturbance.
7. Bites fingernails.
8. Avoids school or work.
9. Exhibits extreme anxiety.
10. Exhibits tics.
11. Cries or laughs too easily.
12. Has poor eye contact.
13. Exhibits excessive unhappiness.
14. Grinds teeth during day or night.
15. Is too impulsive.
16. Has poor concentration and attention.
17. Is overly active.
18. Has temper tantrums.
19. Is negativistic or defiant.
20. Teases or bullies.
21. Shows lack of consideration.
22. Lies, cheats, or steals.
23. Is too physically aggressive.
24. Swears in inappropriate situations.
25. Runs away.
26. Is stubborn or sullen.
27. Is truant from school or work.

A. PART 1 RAW SCORE
(Sum of 2s, 1s, Os Part 1)

PART 2

Note: Part 2 is for individuals who will be compared only with supplementary norm groups.

28. Engages in inappropriate sexual behavior.
29. Has excessive or peculiar preoccupations with objects or activities.
30. Expresses thoughts that are not sensible.
31. Exhibits extremely peculiar mannerisms or habits.
32. Displays behaviors that are self-injurious.
33. Intentionally destroys own or another's property.
34. Uses bizarre speech.
35. Is unaware of what is happening in immediate surroundings.
36. Rocks back and forth when sitting or standing.

B. Sum of 2s, 1s, Os Part 2

PARTS 1 AND 2 RAW SCORE
(Add A and B)

ABOUT THE INTERVIEW:

Respondent's estimate of the individual's functioning

Language used in the interview

Special characteristics of the individual

Estimate of rapport established with the respondent

Estimate of the respondent's accuracy

General observations

Vineland Adaptive Behavior Scales: **INTERVIEW EDITION Survey Form**

Individual's name _____ Chronological age _____

Date of interview _____ Supplementary norm group (if applicable) _____

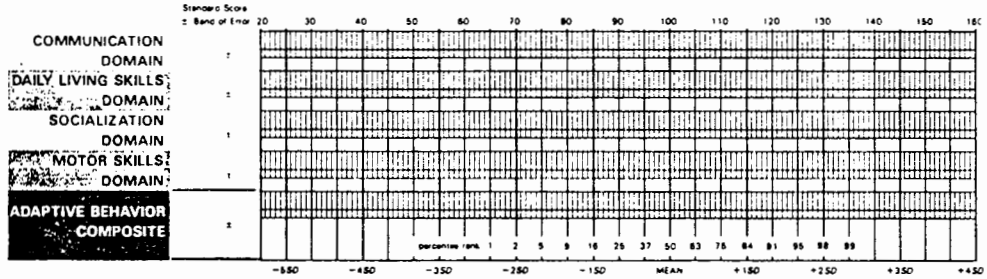
Before beginning the score summary, read Chapter 5 in the manual.

SCORE SUMMARY

SUBDOMAIN	Raw Score	Standard Score X=100, SD=15 Tables B.1 and B.2	Band of Error ___% Confidence Table B.3	National %ile Rank Table B.4	Stanine Table B.4	Supplementary Norm Group %ile Rank Table B.5	Adaptive Level Tables B.6 and B.8	Supplementary Norm Group Adaptive Level Tables B.7 and B.9	Age Equivalent Tables B.10 and B.11
Receptive									
Expressive									
Written									
COMMUNICATION DOMAIN SUM			±						
Personal									
Domestic									
Community									
DAILY LIVING SKILLS DOMAIN SUM			±						
Interpersonal Relationships									
Play and Leisure Time									
Coping Skills									
(For ages to 5-11-30) Gross									
Fine									
MOTOR SKILLS DOMAIN SUM			±						
SUM OF DOMAIN STANDARD SCORES									
ADAPTIVE BEHAVIOR COMPOSITE			±						

(See Chapter 5 in the manual to graph scores.)

SCORE PROFILE



OPTIONAL
MALADAPTIVE BEHAVIOR DOMAIN
(Administer for ages 5-0-0 and older)

	Raw Score	Maladaptive Level: Table B.12	Supplementary Norm Group Maladaptive Level: Table B.13
Part 1			
Parts 1 and 2			

Additional interpretive information (see Chapters 5 and 6 in the manual)

Recommendations

APPENDIX D

PEABODY PICTURE VOCABULARY TEST - REVISED, FORM L

Peabody Picture Vocabulary Test–Revised

INDIVIDUAL TEST RECORD

by LLOYD M. DUNN & LEOTA M. DUNN

FORM L

NAME _____ SEX: M F
(last) (first) (middle initial) (circle)

HOME ADDRESS _____ HOME PHONE _____

SCHOOL _____ GRADE PLACEMENT _____
(or agency) (or educational)

TEACHER _____ EXAMINER _____
(or counselor)

LANGUAGE OF THE HOME: ☐ Standard English; ☐ Other _____
(specify foreign language, or type of English dialect spoken)

Date & Age Data

	Year	Month	Day
Date of testing.....			
Date of birth			
Chronological age.....			*

*If the number of days exceeds 15, add a month to the age (see Part I of the Manual).

Notice to Users

The PPVT–R is not intended for use in situations where truth-in-testing legislation stipulates that copies of test items and correct responses be distributed to subjects, parents, or the general public. Such disclosures may make the norms meaningless in future testing.

Reason for Testing (may include referral source and person authorizing testing)

_____

_____

_____

_____

AGS® Published by American Guidance Service, Inc., 4201 Woodland Road, Circle Pines, Minnesota 55014-1796; toll free 800-328-2560. For additional forms, call or write and ask for item 2002 (25 per package)

FORM L TEST ITEMS AND ABBREVIATED INSTRUCTIONS

Administering the TRAINING ITEMS

For most subjects under age 8: Use Plates A, B, and C. Administer as many training item series as necessary to secure three consecutive correct responses.
For most subjects age 8 and over: Use Plates D and E. Administer as many training item series as necessary to secure two consecutive correct responses.

Training Plate	INITIAL PRACTICE SERIES WORDS & KEYS	ADDITIONAL PRACTICE WORDS & KEYS Alternate Series X	Alternate Series Y	Alternate Series Z
A	doll (4)	fork (1)	table (2)	car (3)
B	man (2)	comb (3)	sock (4)	mouth (1)
C	swinging (3)	drinking (4)	walking (1)	climbing (2)
D	wheel (4)	zipper (2)	rope (1)	rake (3)
E	giant (1)	bride (3)	witch (4)	royal (2)

(Complete directions are given in Part I of the Manual.)

Administering the TEST ITEMS

Basal: Highest 8 consecutive correct responses
Ceiling: Lowest 8 consecutive responses containing 6 errors
Starting Point: For a subject assumed to be of average ability, find the person's age circled in the margin, and begin the test with that item. Otherwise consult Part I of the Manual for further instructions.
Recording Responses and Errors: Record the subject's response (1, 2, 3, or 4) for each item administered. For each error, draw an oblique line either through the plate number of the item missed, or through the geometric figure, as illustrated below:

~~32~~ envelope .... (2) 4 Ω or 32 envelope .... (2) 4 ~~Ω~~

Every eighth figure is identical to help determine the basal and ceiling.

NOTE:
Ages in circles refer to the lowest age in a 6- or 12-month interval. For example, Item 1 is the starting item for ages 2-6 through 3-5, and Item 30 for ages 5-0 through 5-5. Use Item 110 for ages 16-0 and over.

Plate Number	Word	Key	Response	Error
2½ 3	1 bus	(4)	____	○
	2 hand	(1)	____	□
	3 bed	(3)	____	△
	4 tractor	(2)	____	Ω
	5 closet	(1)	____	♡
	6 snake	(4)	____	☆
	7 boat	(2)	____	◇
	8 tire	(3)	____	○
	9 cow	(1)	____	□
3½	10 lamp	(4)	____	△
	11 drum	(3)	____	Ω
	12 knee	(4)	____	♡
	13 helicopter	(2)	____	☆
	14 elbow	(4)	____	◇
4	15 bandage	(4)	____	○
	16 feather	(1)	____	□
	17 empty	(3)	____	△
	18 fence	(4)	____	Ω
	19 accident	(2)	____	♡
4½	20 net	(2)	____	☆
	21 tearing	(4)	____	◇
	22 sail	(1)	____	○
	23 measuring	(2)	____	□
	24 peeling	(3)	____	△
	25 cage	(1)	____	Ω
	26 tool	(4)	____	♡
	27 square	(4)	____	☆
	28 stretching	(1)	____	◇
	29 arrow	(2)	____	○
5	30 tying	(2)	____	□
	31 nest	(1)	____	△
	32 envelope	(2)	____	Ω
	33 hook	(3)	____	♡
	34 pasting	(4)	____	☆
5½	35 patting	(1)	____	◇
	36 penguin	(1)	____	○
	37 sewing	(2)	____	□
	38 delivering	(1)	____	△
	39 diving	(2)	____	Ω
6	40 parachute	(3)	____	♡
	41 furry	(4)	____	☆
	42 vegetable	(4)	____	◇
	43 shoulder	(3)	____	○
	44 dripping	(2)	____	□
	45 claw	(4)	____	△
	46 decorated	(3)	____	Ω
	47 frame	(1)	____	♡
	48 forest	(3)	____	☆
	49 faucet	(2)	____	◇
6½	50 group	(3)	____	○
	51 stem	(3)	____	□
	52 vase	(3)	____	△
	53 pedal	(1)	____	Ω
	54 capsule	(2)	____	♡
7	55 surprised	(4)	____	☆
	56 bark	(2)	____	◇
	57 mechanic	(2)	____	○
	58 tambourine	(1)	____	□
	59 disappointment .	(4)	____	△
	60 awarding	(3)	____	Ω
	61 pitcher	(3)	____	♡
	62 reel	(1)	____	☆
	63 signal	(1)	____	◇
	64 trunk	(2)	____	○
8	65 human	(2)	____	□
	66 nostril	(1)	____	△
	67 disagreement ..	(1)	____	Ω
	68 exhausted	(2)	____	♡
	69 vine	(4)	____	☆
9	70 ceremony	(4)	____	◇
	71 casserole	(2)	____	○
	72 vehicle	(4)	____	□
	73 globe	(3)	____	△
	74 filing	(3)	____	Ω
	75 clamp	(2)	____	♡
	76 reptile	(2)	____	☆
	77 island	(1)	____	◇

Plate Number	Word	Key	Response	Error
78	spatula	(3)	____	○
79	cooperation. . . .	(4)	____	□
(10) 80	scalp.	(4)	____	△
81	twig.	(2)	____	Ω
82	weasel	(2)	____	♡
83	demolishing . . .	(4)	____	☆
84	balcony.	(1)	____	◇
(11) 85	locket	(1)	____	○
86	amazed.	(3)	____	□
87	tubular.	(1)	____	△
88	tusk.	(1)	____	Ω
89	bolt	(3)	____	♡
(12) 90	communication .	(4)	____	☆
91	carpenter	(2)	____	◇
92	Isolation	(1)	____	○
93	inflated	(3)	____	□
94	coast.	(3)	____	△
(13) 95	adjustable	(2)	____	Ω
96	fragile	(3)	____	♡
97	assaulting	(1)	____	☆
98	appliance	(1)	____	◇
99	pyramid.	(4)	____	○
(14) 100	blazing	(1)	____	□
101	hoisting.	(1)	____	△
102	arch.	(4)	____	Ω
103	lecturing	(4)	____	♡
104	dilapidated	(4)	____	☆
(15) 105	contemplating . .	(2)	____	◇
106	canister.	(1)	____	○
107	dissecting	(3)	____	□
108	link	(4)	____	△
109	solemn	(3)	____	Ω
(16) 110	archery	(2)	____	♡
111	transparent	(3)	____	☆

Plate Number	Word	Key	Response	Error
112	husk	(1)	____	◇
113	utensil.	(2)	____	○
114	citrus.	(3)	____	□
115	pedestrian.	(2)	____	△
116	parallelogram . .	(1)	____	Ω
117	slumbering	(3)	____	♡
118	peninsula	(4)	____	☆
119	upholstery.	(2)	____	◇
120	barricade.	(4)	____	○
121	quartet	(4)	____	□
122	tranquil	(3)	____	△
123	abrasive	(1)	____	Ω
124	fatigued.	(3)	____	♡
125	spherical	(2)	____	☆
126	syringe	(2)	____	◇
127	feline	(2)	____	○
128	arid	(4)	____	□
129	exterior	(1)	____	△
130	constellation . . .	(4)	____	Ω
131	cornea.	(2)	____	♡
132	mercantile.	(1)	____	☆
133	ascending	(3)	____	◇
134	filtration.	(1)	____	○
135	consuming	(4)	____	□
136	cascade	(4)	____	△
137	perpendicular . .	(3)	____	Ω
138	replenishing . . .	(1)	____	♡
139	emission	(3)	____	☆
140	talon	(3)	____	◇
141	wrath.	(3)	____	○
142	incandescent . .	(4)	____	□
143	arrogant	(2)	____	△
144	confiding	(3)	____	Ω
145	rhombus	(3)	____	♡

Plate Number	Word	Key	Response	Error
146	nautical	(3)	____	☆
147	tangent	(1)	____	◇
148	inclement	(4)	____	○
149	trajectory.	(1)	____	□
150	fettered	(1)	____	△
151	waif	(3)	____	Ω
152	jubilant	(2)	____	♡
153	pilfering.	(4)	____	☆
154	repose.	(2)	____	◇
155	carrion.	(3)	____	○
156	indigent.	(2)	____	□
157	convex	(1)	____	△
158	emaciated.	(2)	____	Ω
159	divergence	(4)	____	♡
160	dromedary	(2)	____	☆
161	embellishing . . .	(2)	____	◇
162	entomologist . . .	(3)	____	○
163	constrain.	(1)	____	□
164	infirm.	(1)	____	△
165	anthropoid.	(3)	____	Ω
166	specter	(4)	____	♡
167	incertitude.	(2)	____	☆
168	vitreous.	(1)	____	◇
169	obelisk	(1)	____	○
170	embossed.	(4)	____	□
171	ambulation	(2)	____	△
172	calyx	(2)	____	Ω
173	osculation	(3)	____	♡
174	cupola.	(4)	____	☆
175	homunculus . . .	(4)	____	◇

Calculating Raw Score

Ceiling item . . . . . ____

minus errors* . . . . . ____

Raw score . . . . .

*Count errors between highest basal and lowest ceiling only

Obtained Test Scores

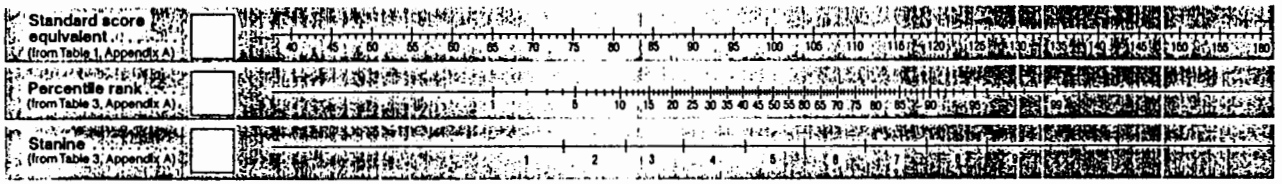
Raw score . . . . . (from page 4)

TRUE SCORE CONFIDENCE BAND

Mark the obtained standard score equivalent on the top scale. Then draw a heavy, straight, vertical line through it, and across the three scales. This line will extend through the three obtained deviation-type test scores. Depending upon the obtained standard score, shade in a band on both sides of the vertical line, using the schedule to the right. An example is given in Figure 1.4 of the Manual.

Obtained Standard Score	AREA TO SHADE Left of line	Right of line	Obtained Standard Score	AREA TO SHADE Left of line	Right of line
Below 65	0	14	100-109	7	7
65-74	2	12	110-114	8	8
75-84	4	10	115-124	10	4
85-89	6	8	125-134	12	2
90-99	7	7	135 & above	14	0

This shaded area provides a confidence band: the range of scores within which the subject's true scores can be expected to fall 68 times in 100. (These band width values are based on a median standard error of measurement (SEM) of ± 7, with the band widths made increasingly asymmetrical toward the extremes to allow for *regression to the mean*.) See Part I of the Manual and the Technical Supplement for more precise values and a discussion of SEM confidence bands. Also see the Manual for a discussion of how to calculate the true score confidence band for the *age equivalent*.



Age equivalent . . . . (from Table 4, Appendix A)

EXTREMELY LOW SCORE | MODERATELY LOW SCORE | LOW AVERAGE SCORE | HIGH AVERAGE SCORE | MODERATELY HIGH SCORE | EXTREMELY HIGH SCORE

Data from Other Tests

Test		Date	Results
PPVT–R	FORM M		

Performance Evaluation

This standardized test provides an *estimate* only of this individual's hearing vocabulary in Standard English, as compared with a cross-section of U.S.A. persons of the same age. Do you believe the performance of this subject represents fairly her or his true ability in this area? _____ Yes _____ No If not, cite reasons such as rapport problems, poor testing situation, hearing or vision loss, visual-perceptual disorder, test too easy or too hard (automatic basal or ceiling used), etc.

Observations

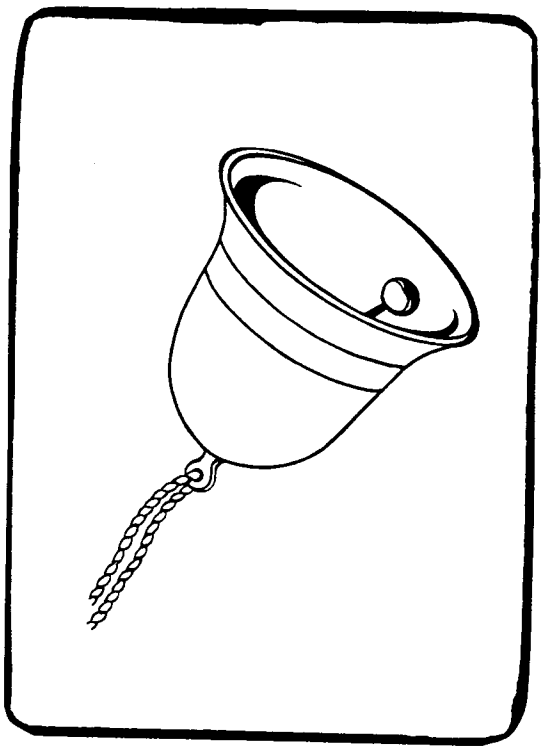
Briefly describe the subject's test behavior, such as interest in task, quickness of response, signs of perseveration, work habits, etc.:

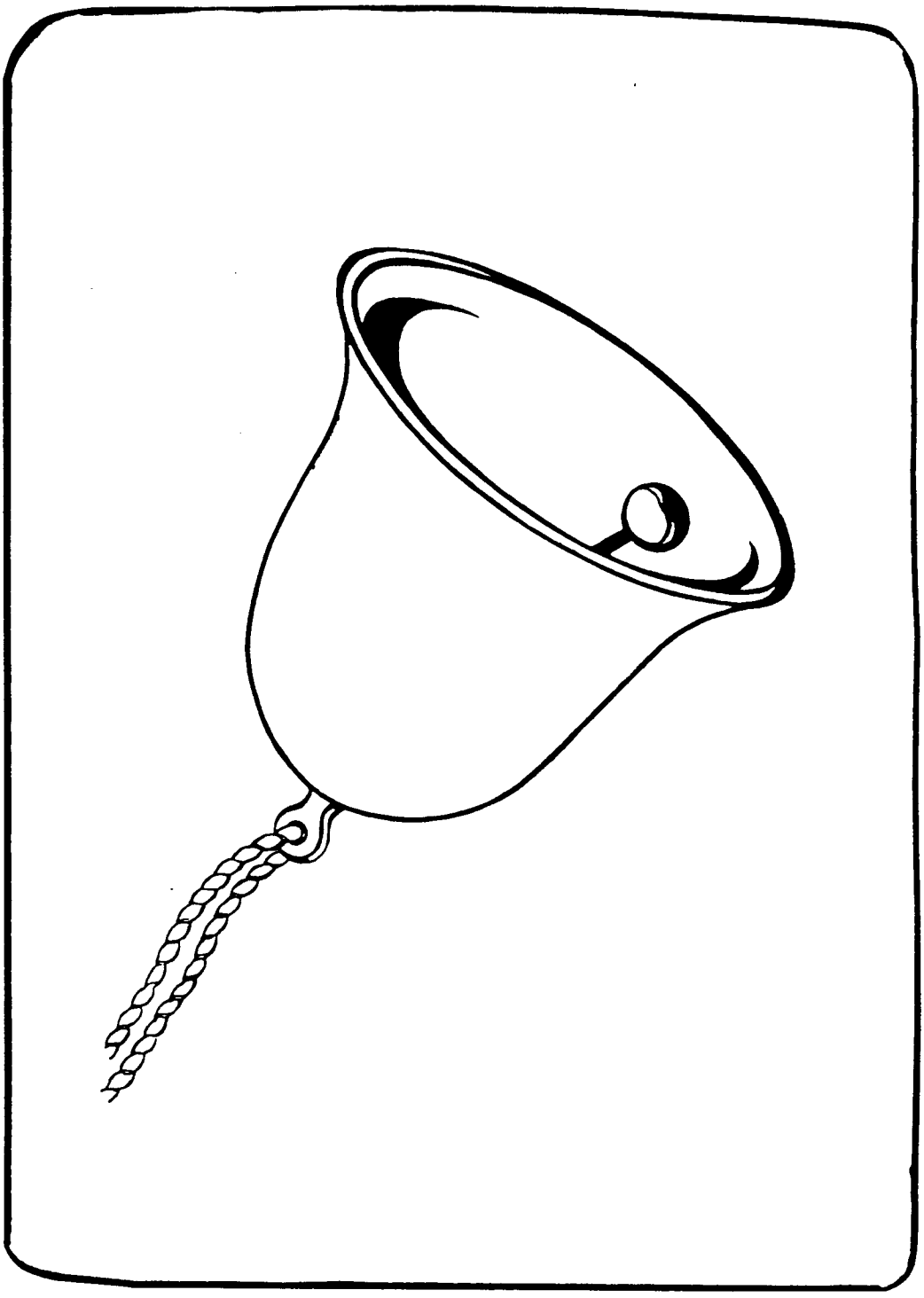
Recommendations

Examiner's signature

APPENDIX E

PEABODY PICTURE VOCABULARY TEST- REVISED
SIZE MODIFICATIONS





APPENDIX F

RAW DATA TABLE

SUBJ	AGE	GENDER	GROUP	PPVT SS	PPVT AE	REC AE	EXP AE	COMM SS	DL SS	SOC SS	GM AE	FM AE	MOT SS	MOT AE	COMP SS
1	44	male	severe	79	33	30	18	63	52	71	6	7	30	7	50
2	56	female	moderate	79	42	47	25	67	54	74	23	18	48	21	56
3	68	male	mild	84	54	47	31	61	87	90	72	72	115	55	84
4	62	male	moderate	39	27	47	23	56	45	63	20	20	38	19	47
5	37	female	severe	75	26	22	14	64	50	63	4	4	36	3	49
6	37	male	moderate	108	41	47	39	108	72	103	14	14	52	14	78
7	52	male	moderate	98	50	47	48	100	72	107	13	28	45	17	75
8	72	male	severe	73	49	22	14	44	25	52	4	4	19	3	32
9	68	female	mild	82	50	47	34	65	70	86	33	62	70	46	67
10	50	male	severe	39	23	21	14	55	53	73	29	24	58	28	55
11	47	female	moderate	57	27	18	16	57	51	67	20	18	50	19	52
12	62	male	moderate	59	36	26	23	55	44	79	11	36	38	19	50
13	41	female	moderate	81	30	30	21	70	56	73	22	36	67	28	61
14	71	male	severe	40	30	18	11	43	24	52	9	6	19	8	27
15	43	male	severe	56	26	22	16	60	51	52	4	8	28	6	44

AE - age equivalent

SS - standard score

REC - VABS receptive communication

EXP - VABS expressive communication

COMM - VABS communication skills domain

DL - VABS daily living skills domain

SOC - VABS socialization skills domain

GM - VABS gross motor

FM - VABS fine motor

MOT - VABS motor skills domain

COMP - VABS composite